BBC wildlife

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Exploring the Amazon jungle by boat

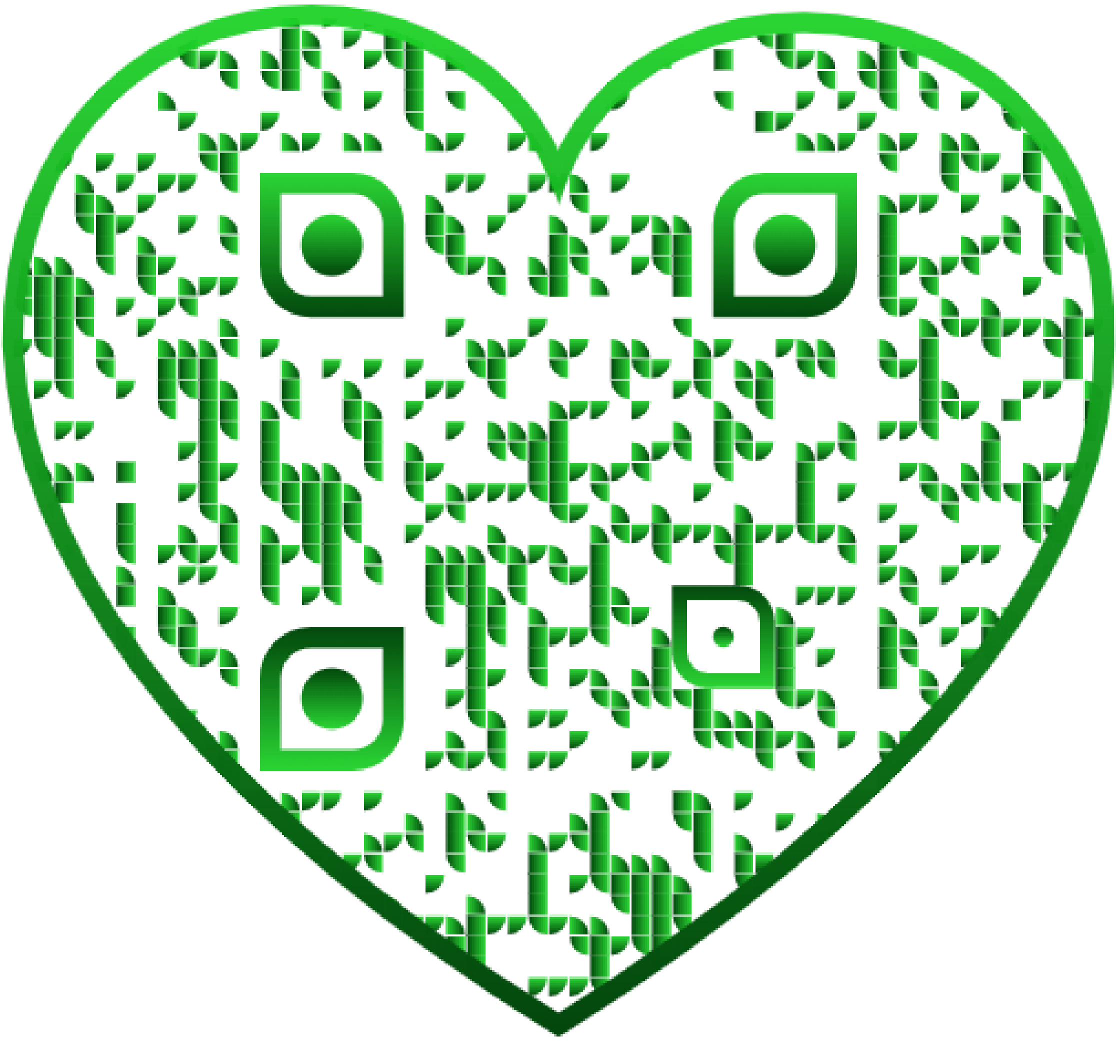
Italy's Marsican brown bears

Protecting birds of prey in Kenya

The TRAVEL issue

NIGHT PROWL

How 'noctourism' is changing the way we see wildlife



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ON THE BBC THIS MONTH

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BBC RADIO 4 Is there anywhere left on Earth that is unaffected by humans? Presenter Caroline Steel speaks to environmentalists and scientists, and takes her quest from underwater caves to a fiery, alien world.
Catch up on BBC Sounds

Black rhino

Six Rare Rhino Moments

BBC earth Due to poaching, very few rhinos can survive outside protected areas. However, there is hope in the form of individuals who dedicate their lives to protecting these incredible animals.
Catch up at youtube.com/bbcearth

CrowdScience

BBC WORLD SERVICE Do birds understand us? To find out, in this episode we meet a bird whisperer in Guinea, an Austrian researcher who has found that greylag geese have personalities, and a professor trying to get inside ravens' minds.
Catch up on BBC Sounds

UNDERWATER CAVE: JOSÉ FRANCISCO MARTÍN PIÑATEL/ALAMY; BLACK RHINO: BEN McRAE/ALAMY; TREE FROG: YASHPAL RATHORE/NATUREPL.COM

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A small tree frog comes out under the starry sky, Western Ghats, India

Seeing wildlife in the dark heightens our other senses

PAUL McGUINNESS, EDITOR

I'll never forget my first night in the Amazon. With head torches on we walked from the comfort of the lodge into the pitch dark jungle, nervously joking about the various ways we could meet a sticky end, while staying just that bit closer together than during the day.

It wasn't long before we were deep into the darkness and our guide told us to stand still, turn off our torches and listen. That's when I heard it – the growing din of the jungle. The clicks and whistles of frogs, the gutteral roar of howler monkeys, and the mildly terrifying splosh that may or may not have been an anaconda winding its way through the waters close by.

Noctourism, the rising trend for seeing wildlife after dark, is the subject of a revealing feature this month (*p56*). And with so many of our most fascinating species being nocturnal, it makes perfect sense. Just don't forget your torch!

Paul

BBC wildlife

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THE COVER

Photographer Andy Rouse took this stunning portrait of a male ocelot standing on a branch at dusk in Pantanal, Brazil. The species is known as a good climber and inhabits tropical forests, grasslands and brush-covered regions. *See p56*

The hidden world of wildlife at night

OCELOT: ANDY ROUSE/NATUREPL.COM; SHARKS: HENLEY SPIERS/NATUREPL.COM; FLYING EGRET: DAVID TIPLING/NATUREPL.COM; BROWN-THROATED SLOTH: ROBERT HARDING/ALAMY; TARANTULA HAWK WASP: ERIK LOWENBACH/GETTY

Every month, only in *BBC Wildlife*

NICK BAKER
"The fact that caecilians have jaws with several rows of formidable teeth is not even the half of it." *p32*

KATE BRADBURY
"At this time of year you might see red admirals on ivy flowers or late-summer garden favourites." *p25*

MIKE DILGER
"Peak events can see the arrival of around 300,000 gravid female olive ridley turtles in a few days." *p28*

DAVID LINDO
"I've watched monk parakeets foraging for scraps in Madrid alongside bemused pigeons." *p27*

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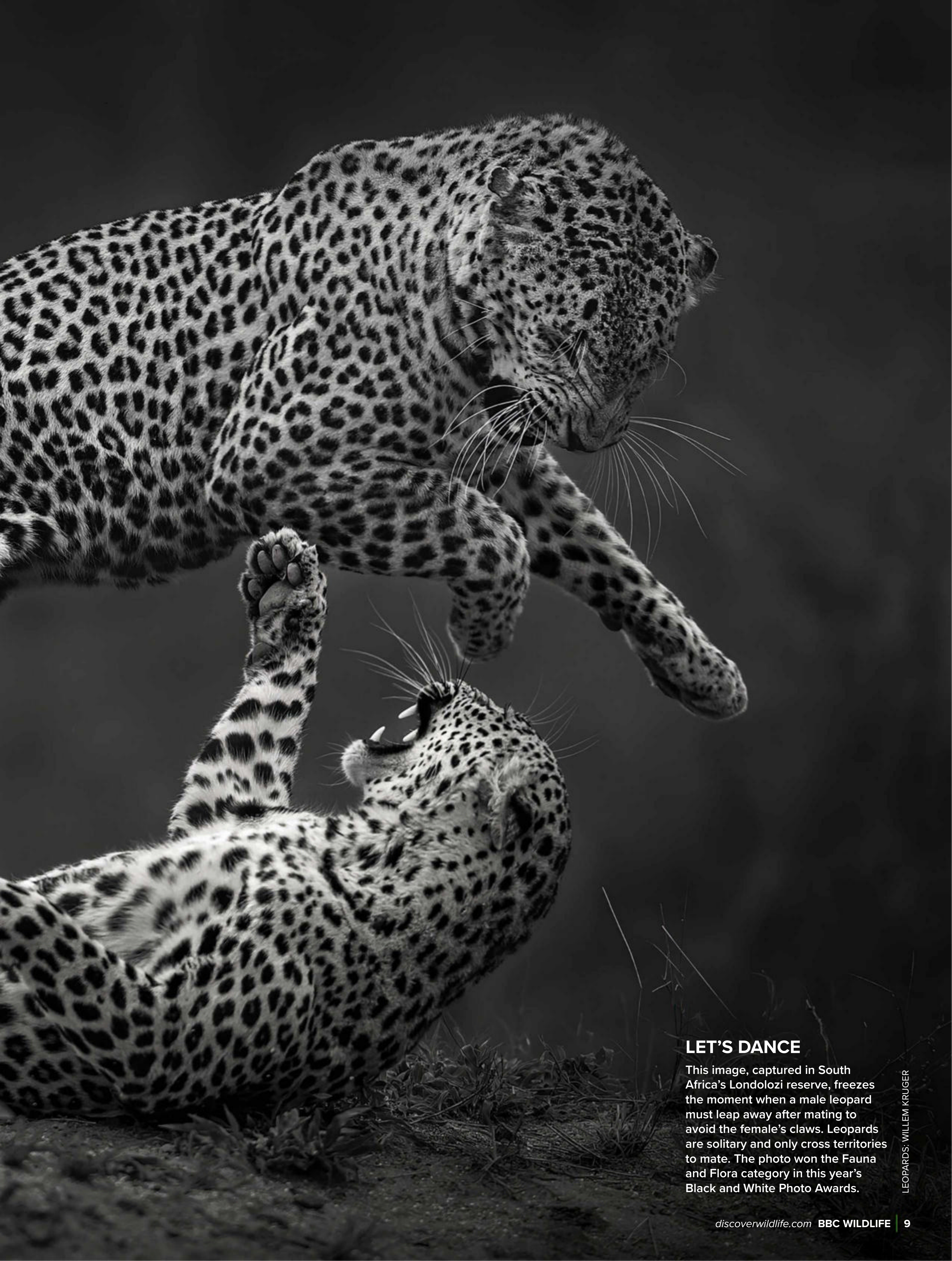
The latest news, photography and seasonal wildlife highlights



LET'S DANCE

This image, captured in South Africa's Londolozi reserve, freezes the moment when a male leopard must leap away after mating to avoid the female's claws. Leopards are solitary and only cross territories to mate. The photo won the Fauna and Flora category in this year's Black and White Photo Awards.

LEOPARDS: WILLEM KRUGER

A leaf-chewing mature male in Bako National Park, Sarawak

Proboscis monkey's big nose boosts vocal identity

A new study shows how nose shape creates resonant frequencies that allow individuals to be recognised

NEW RESEARCH SUGGESTS THAT THE fleshy, pendulous noses of male proboscis monkeys – the biggest of any primate – are distinguishing features in more ways than one. The noses of these pot-bellied monkeys, found only in Borneo, are particularly pronounced in mature males, and previous research has shown they serve as a visual signal of dominance that attracts females and deters rival males without physical aggression. It also amplifies the 'bray' calls males emit through the nose while keeping their mouths closed.

But biologists in Japan have now found evidence of another function for this formidable facial feature. As described in the *Journal of the Royal Society Interface*, they used a medical CAT scanner to map the internal structure of the nasal cavities of different males and then printed detailed 3D models to analyse how sounds are shaped as they pass through them. This showed that, by amplifying and dampening different frequencies of sound, each nose emits a distinct vocal signature.

"The idea that the proboscis itself serves to signal or amplify individual signatures is interesting. Such morphological adaptations are normally explained through their role in mate attraction or signalling body size rather than ID," says Simon Townsend, who works on vocal communication in animals at the University of Zürich, but was not part of the study.

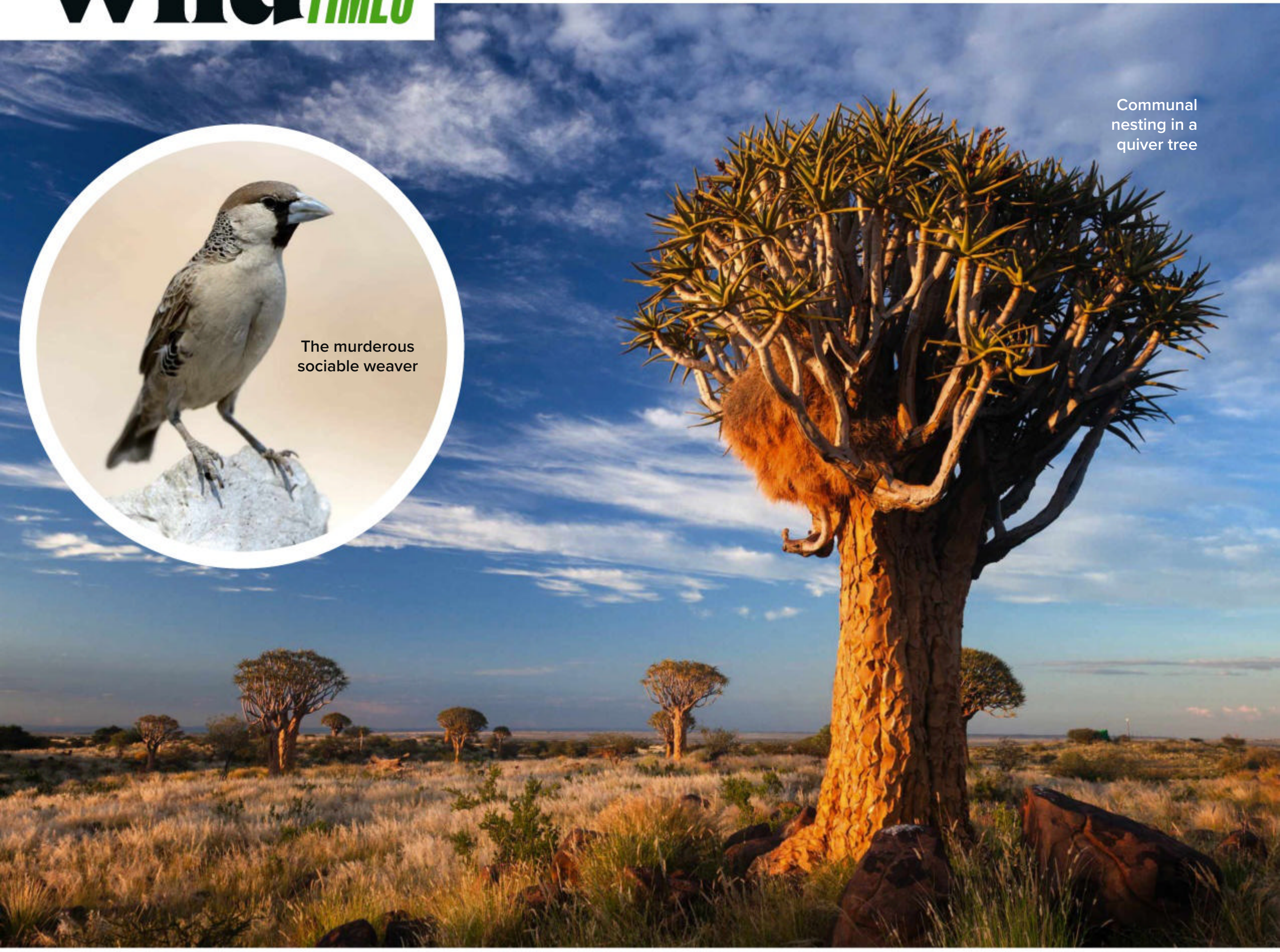
The research team suggests individualised calls make sense in terms of the species' natural history. Proboscis monkeys can form core groups of one single male and multiple females, but groups come together in looser associations, called bands, which can include bachelor males. The result is intense competition for access to females, and band-members might benefit from keeping track of who's who.

Townsend adds that vocal signatures might be especially helpful in the rainforest habitat, where dense foliage can obscure visual cues.

That said, how other members of the group use these individual calls when they hear them is not yet known. Takeshi Nishimura of the University of Osaka and his team are working out how to investigate this by playing back recordings of individual calls to other monkeys. "We have not come up with a good way to test it. What behaviour would indicate they use such calls? It's a difficult task." **Stuart Blackman**

PROBOSCIS MONKEY: FIONA ROGERS/NATUREPL.COM; HEAD: IKKI MATSUDA

The nasal passage of the external nose



Communal nesting in a quiver tree

The murderous sociable weaver

Sociable weavers on a killing spree

These Southern African birds commit infanticide – for no known reason

THEY BUILD THE LARGEST COMMUNAL bird nests in the world but the avian societies of sociable weavers (*Philetairus socius*) are far from utopian. New research published in the journal *bioRxiv* shows that the Southern African birds regularly commit infanticide, the intentional killing of a hatchling or immature animal – in this case often unrelated nestlings.

"They usually peck the chicks on the head to kill or weaken them, then throw them out of the nest. Very small chicks they just throw out," says lead author Rita Covas, a behavioural ecologist and evolutionary biologist at Portugal's University of Porto.

She and her colleagues analysed video taken between 2014 and 2023 at a set of 11 sociable weaver colonies in Benfontein Nature Reserve, Northern Cape Province, South Africa. They found that 40 different birds made 50 attempts to kill nestling birds. They were successful in 33 cases.

"The intruders usually only manage to attack chicks when no adults from their group are around. If one of the parents or helpers from the group sees an intruder in the nest, it will chase it," Covas says.

Most of the aggressors were born outside of the breeding group (82.5 per cent) and most were female (59 per cent). Male sociable weavers typically remain in their natal colonies, while females usually disperse to other colonies. "Males have lots of relatives in the colonies where they breed, and hence should have less incentive to commit infanticide, as they would have a higher chance of killing relatives with whom they share genes," says Covas.

A majority of the killers (62.5 per cent) were not born in the colony they attacked. They did not reproduce in the chambers they attacked or pair with one of the parents – except in one case, over a year later. This suggests the birds gain no direct reproductive benefit from killing nestlings. That is, they don't clear nesting chambers so they can set up their own families there.

The researchers hypothesise that the benefits of these infanticides are more indirect. Killing young birds may reduce resource competition, either in the present or the future, benefiting potential offspring of the killers. **Richard Pallardy**

NEST IN TREE: HOUGAARD MALAN/NATUREPL.COM; SOCIABLE WEAVER: ERIC BACCEGA/NATUREPL.COM

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SEA STAR WASTING DISEASE MYSTERY SOLVED

Scientists have identified the bacterium (*Vibrio pectenicida*) responsible for SSWD, the wasting disease that affects more than 20 species of sea star on North America's west coast and has killed over five billion sunflower sea stars. Knowing the cause will benefit recovery efforts for the sea stars and the kelp forests impacted by their loss.

Sunflower sea stars growing among vase tunicates off Canada

Michegan's pit vipers are under threat

Rattlesnakes inbreeding

Break up of habitat leads to desperate measures

Eastern massasauga rattlesnakes, unique to the state of Michigan, USA, are struggling to survive as habitat fragmentation forces them to breed with close relatives, new research finds. These small, venomous pit vipers are creatures of habit. They rarely leave the wetland where they are born, typically venturing out only to find food or a mate.

As human presence increases, barriers such as roads, farms and housing mean snakes are less likely to travel to find unrelated mates – populations can be cut off.

To find out how this is impacting the snakes, researchers at Michigan State University (MSU) analysed 1,056 individuals collected in south-west Michigan over a 15-year period. Their findings, published in *PNAS*, revealed worrying levels of inbreeding, with DNA from blood samples showing that the most inbred individuals were 13 per cent less likely to have offspring that survived and had a nearly 12 per cent lower annual survival rate than less inbred snakes.

"The fact we're detecting problems from inbreeding is concerning, given that many populations in the Midwest are smaller and even more fragmented," says MSU professor and co-author of the study Sarah Fitzpatrick.

Fitzpatrick warns that if eastern massasaugas disappear, the entire balance of Michigan's wetland ecosystem would be disrupted; for example, the rattlesnakes are skilled hunters of rodents such as mice and rats and help keep numbers under control.

It's hoped the study will help drive conservation action in the area, such as creating wildlife crossings, restoring wetlands and even relocating snakes to boost genetic diversity. **Daniel Graham**

SEA STARS: BENNETT WHITNELL/HAKAI INSTITUTE; RATTLESNAKE: ERIC HILEMAN

The battle of the pollinators

A dramatic rise in the number of managed beehives is negatively impacting wild pollinating insects

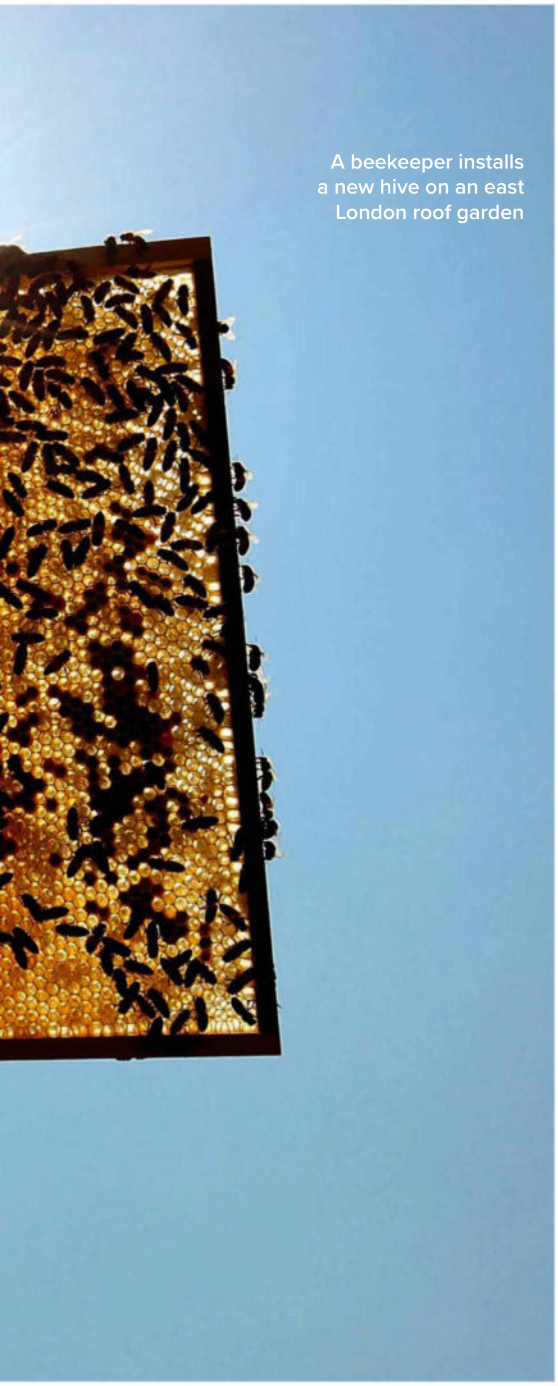
It's an amazing experience to put on a bee suit and see a hive," says Andrew Whitehouse, head of operations for the invertebrate conservation group, Buglife. "There's suddenly thousands and thousands of bees flying around you. But you know," he adds, "beekeeping doesn't give you a connection to nature."

That may surprise some readers, but Whitehouse's point is that a beehive is as natural as a pasture full of grazing sheep and, like a lot of livestock, domesticated honeybees also have a negative impact on actual wildlife. They compete with wild pollinators for nectar and pollen, and transmit diseases to them, too.

> "In the UK, the number of beehives has more than tripled from approximately 80,000 in 2008 to more than 240,000 today"

Invertebrate ecologist and campaigner Dave Goulson made a similar point in a video he posted on social media earlier this year. Some companies have run campaigns in the past, he noted, saying they are going to help save the bee by encouraging all the farmers who supply them to keep more hives. This was, he went on, akin to trying to reverse bird declines by keeping more chickens.

And just to be clear, like chickens, honeybees are doing extremely well around the world. According to the UN's Food and Agriculture Organisation (FAO), the number of managed beehives globally is around 100 million and increased by 85 per cent between 1961 and 2017, while honey production grew by 181 per cent over the same period.



A beekeeper installs a new hive on an east London roof garden

Urban beehives on a rooftop on Bankside in south London

> **“The number one problem is that there are just not enough flowers”**

In the UK, the growth has been even more dramatic and the number of beehives has more than tripled from approximately 80,000 in 2008 to more than 240,000 today.

It’s a moot point as to whether honeybees are as environmentally harmful as sheep or chickens, but over the past five years or so it has become increasingly clear that where they are present in dense concentrations, other pollinators are not faring as well. Buglife has calculated that a single hive needs two hectares of wildflower habitat to feed it during the year, and in the UK – and other parts of Europe – we know that kind of habitat is severely lacking.

In short, many more mouths to feed but the same amount of food resources, in the shape of nectar and pollen, results in some insects going hungry.

The science backs this up. For example, one study from 2019 carried out in Paris found the pollinating activity of bumblebees, solitary bees and beetles negatively correlated to the density of honeybee hives in the locality. “Our results are consistent with the hypothesis that honeybees might outcompete wild pollinating fauna by exploiting flowering rewards,” say the authors of the paper, published in the journal *PLOS One*.

MORE RECENTLY, SCIENTISTS IN Vienna found a high degree of overlap in the ecological traits – such as the size of their tongues and the distance they travelled to forage – between rare wild solitary bees and bumblebees in highly protected areas within the city. Such similar adaptations could mean more competition for the same kinds of flowers.

“Our conclusion is that beekeeping should not continue in these areas or that density of hives should be reduced,” says Sophie Kratschmer of BOKU University’s Institute of Zoology. “However, the flower supply needs to be increased in urban green zones outside these areas, and suitable alternatives for beekeepers provided.”

Other studies have found density of honeybee hives vastly outweighs the carrying capacity of many cities. Kew Gardens’ Phil Stevenson, for example, showed in a paper published by the New Phytologist Foundation that London shouldn’t have any more than 7.5 hives per hectare, but an organisation called Apicultural – which creates and manages pollinator habitat for corporate clients – has said parts of the city could see densities of 50 hives per hectare or more. An average of 10–30 is probably more normal, but even these exceed what is regarded as sustainable.

Apicultural’s owner, ecologist Mark Patterson, says the problem of over-supply of honeybees is a result of companies offering to help large businesses with their Corporate Social Responsibility by installing beehives on rooftops or land they own. At the same time, the number of small, hobby beekeepers – who understand that you can’t have too many colonies – is diminishing, and commercial concerns are taking over.

“A lot of them don’t realise it can do more harm than good,” says Patterson. “They think it’s ‘Win, win, win,’ but it’s not.” He says many local authorities are not happy with the situation either, and could restrict how many hives are installed.

BBC Wildlife contacted two companies: Alvéole, a Canadian company that (in its own words) “leverages bees on more than 2,200 commercial buildings to help companies increase tenant satisfaction and engagement, earn green building credits, and monitor real estate’s impact on nature and biodiversity”; and PlanBee, which is based in Scotland.

URBAN BEEKEEPING: DAN KITWOOD/GETTY; URBAN BEE HIVES: JANET SHEPPARDSON/ALAMY

This honeybee hovers in its Bath city habitat

BEE NEAR SNOWBERRY FLOWERS: NICK UPTON/2020VISION/NATUREPL.COM

“Every new hive needs an estimated two hectares of new wildflower habitat”

Both Avéole and PlanBee install beehives on their clients’ real estate to provide environmental brownie points with their customers as well as with their employees. We asked each company about the concerns expressed by conservationists.

Lynn Hall, commercial and operations manager for PlanBee, whose clients include Glengoyne Distillery, commercial property company Knight Frank and technology company Siemens, says when they engage with a client, they don’t simply offer to install beehives.

“Our head beekeeper is very passionate about responsible beekeeping, and if it looks as if there are too many hives in an area, we will suggest something different,” Hall says. “Alongside [any new hives], we will encourage companies to do other things, such as wildflower meadow sowing and providing planters to support the hives and other pollinators.”

Responding to this, Whitehouse says that for every new hive, it’s estimated that two hectares of new wildflower habitat needs to be created. “From what I know, these companies cannot be putting in that amount of habitat to compensate for those extra bees,” he adds. “Just planting a few flowerbeds or a road verge is not enough.”

Hall refers to one project PlanBee carried out for an offshore wind energy company in Grimsby, where they were asked to transform a quarter of a hectare car park that was no longer in use. “We have turned that concrete space into a modular garden that is nice to look at for the community, is benefiting wild pollinators and has four honeybee hives,” she says.

Company employees are encouraged to get involved with checking the hives, if they wish. “Beekeeping provides a form of meditation for some people,” Hall adds. But according to Buglife’s figures, if the company put in four hives on the car park site, they would have needed eight hectares of wildflower-rich meadows to provide for the hives’ 150,000 or so bees (a single hive can contain 30–40,000).

Responding to this, Hall describes the two hectares figure as a useful “rule of thumb” but says “honeybees can forage several kilometres from their hive and well beyond the immediate two hectares.”

The other company, Alvéole, did not put someone forward to be interviewed, but did provide a statement in which it emphasised the importance of its work in reconnecting people with nature. Its client projects include ‘wild bee habitats’ and ‘biodiversity education’, as well as the installation of beehives. According to Avéole’s statement, “Our projects generate biodiversity data, including pollinator activity and habitat indicators, that provide benchmarkable, actionable insights for our customers”.

Whitehouse emphasises that Buglife is not anti-beekeeping and that companies offering hive installation services are not dishonest or concealing bad intentions, they’re just “misguided”. He says the explosion of interest in honeybees in the UK appears to have come about as a result of campaigns, run by the likes of Buglife and others, highlighting the threat to wild pollinators, but the message has come to represent the domesticated species.

Still, as Whitehouse also points out, the main driver of pollinator decline in the UK is loss of habitat. “There are issues around pesticides, pollution and climate change, but the number one problem is that there are just not enough flowers.”

ABOUT THE AUTHOR

James Fair is a wildlife journalist with a specialism in conservation and controversial issues. Read more at jamesfairwildlife.co.uk.

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wild NOVEMBER

7 nature encounters for the month ahead

WITH NATURALIST AND AUTHOR BEN HOARE

Large numbers of pink-footed geese fly south to spend winter along the UK coast

1

Wild goose chase

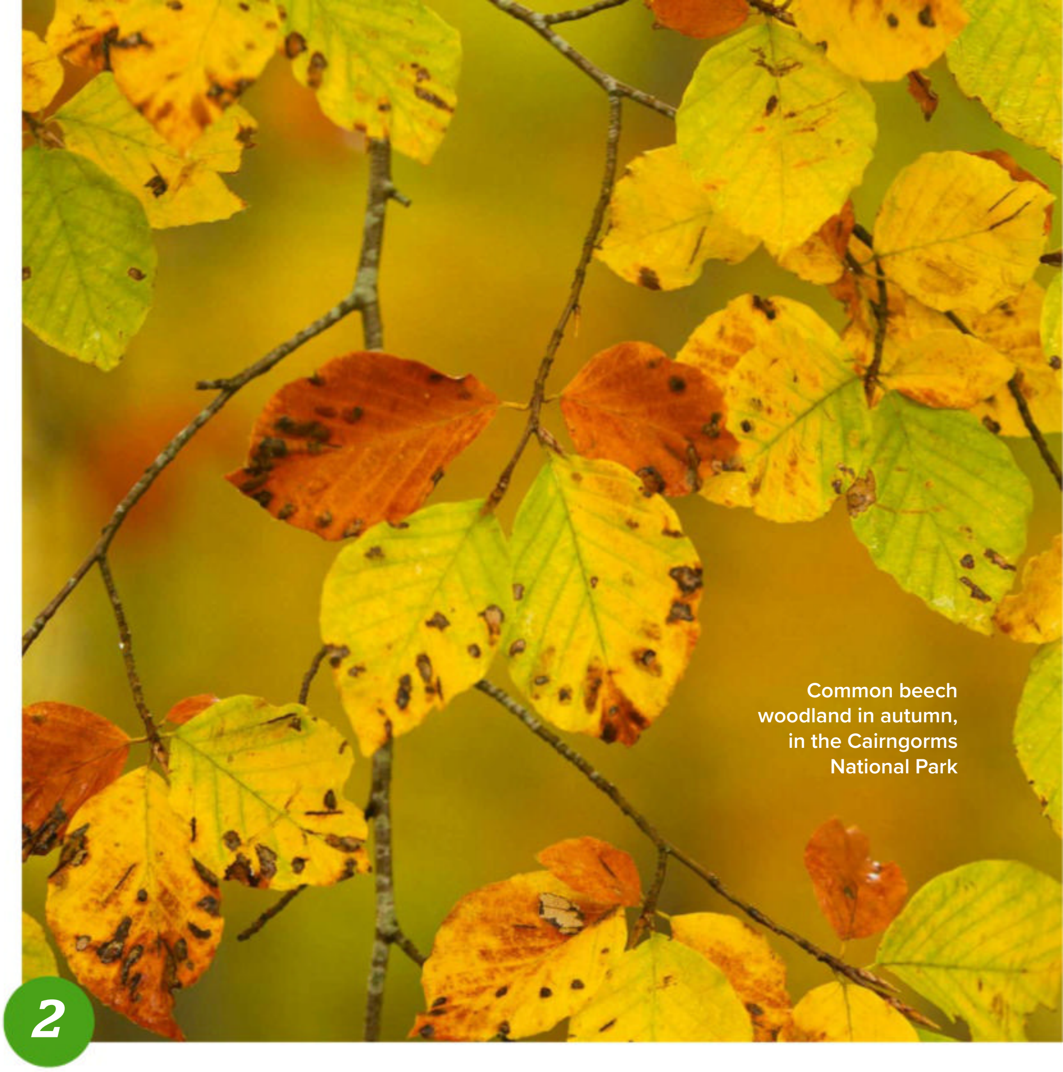
THE ARRIVAL OF PINK-FOOTED geese is a seasonal event that people have been watching since time immemorial. Fresh from their Icelandic breeding grounds, the geese will now spend the next few months feeding in fields along the coast, returning each evening to roost on mudflats and saltmarshes, out of reach of foxes. Their straggling skeins create exquisite patterns in the sky, while their *ink ink* cries can't help but lift the spirits.

2

Autumn gold

LEAF PEEPING IS A JAPANESE AND NORTH American tradition that has gained a much higher profile in Britain in recent years, driven in part (as it is in those places) by social media. Given that the timing of this spectacle naturally varies, even more so now due to the increasingly volatile climate, updates on our phones have proved to be a great way to ensure woodland visits hit the sweet spot when autumn colour is at its best. The new generation of interactive nature journaling apps, such as Encounter, are brilliant at this.

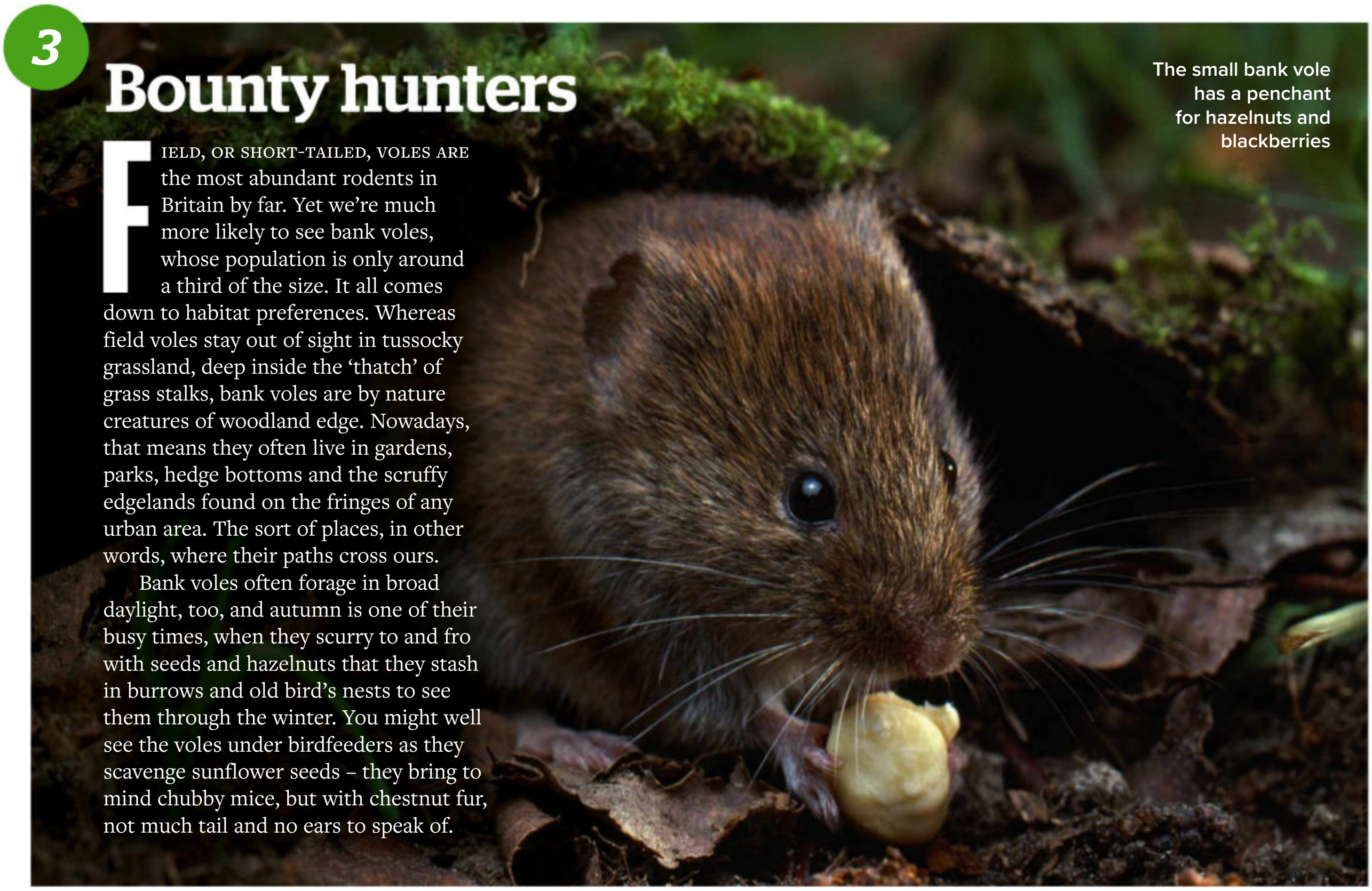
Beech, with its stunning golden foliage, is arguably the native British tree that produces the finest autumnal display. (In fact, its uniquely bright green spring foliage is also pretty incredible.) Silver birch and mountain ash are not far behind. There's usually a two- or three-week window before the golden leaves start to fall or are blown off trees by storms. The process by which the leaves finally drop, called abscission, involves a weak spot at the base of the leaf stems suddenly giving way.



Common beech woodland in autumn, in the Cairngorms National Park

3

Bounty hunters



FIELD, OR SHORT-TAILED, VOLES ARE the most abundant rodents in Britain by far. Yet we're much more likely to see bank voles, whose population is only around a third of the size. It all comes down to habitat preferences. Whereas field voles stay out of sight in tussocky grassland, deep inside the 'thatch' of grass stalks, bank voles are by nature creatures of woodland edge. Nowadays, that means they often live in gardens, parks, hedge bottoms and the scruffy edgelands found on the fringes of any urban area. The sort of places, in other words, where their paths cross ours.

Bank voles often forage in broad daylight, too, and autumn is one of their busy times, when they scurry to and fro with seeds and hazelnuts that they stash in burrows and old bird's nests to see them through the winter. You might well see the voles under birdfeeders as they scavenge sunflower seeds – they bring to mind chubby mice, but with chestnut fur, not much tail and no ears to speak of.

The small bank vole has a penchant for hazelnuts and blackberries

GEESE: PHILIP MUGRIDGE/ALAMY; BEECH LEAVES: MARK HAMBLIN/2020VISION/NATUREPL.COM; VOLE: STEPHEN DALTON/NATUREPL.COM

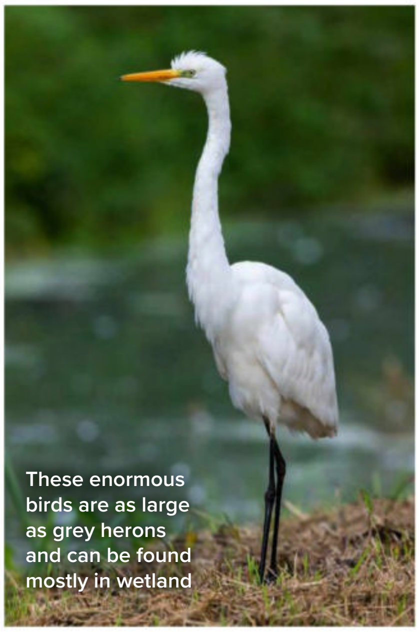
4

Once a rare visitor to the UK, many great white egrets now winter here

Taking flight

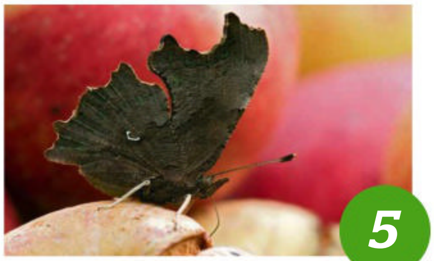
GREAT WHITE EGRETS ARE RAPIDLY spreading north through Europe, probably in response to our changing climate. These elegant herons first bred in Britain only in 2012, but have already gained a firm toehold in the Somerset Levels and East Anglia, with new populations springing up elsewhere.

After the egrets' summer breeding season is over, some of the birds invariably disperse, and this wandering behaviour seems to play a key part in their range expansion. Egrets ringed in Somerset as chicks (and thus identifiable in future) have turned up all over England, as well as in Wales, Scotland and Northern Ireland.


These enormous birds are as large as grey herons and can be found mostly in wetland

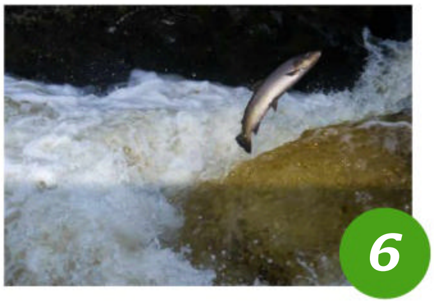
ABOUT THE AUTHOR

Ben Hoare is a wildlife writer, editor and all-round nature nerd. He also writes award-winning illustrated natural history books for children.


5

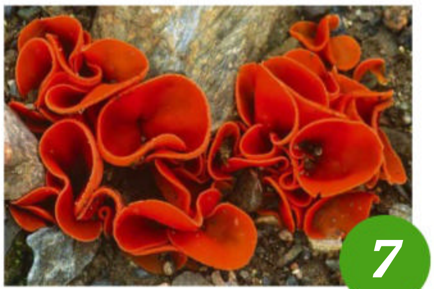
Leafy wings

The comma has upper wings the colour of glowing embers and under wings in various muted browns. Add a scalloped, leaf-like silhouette and you have the perfect camouflage for autumn woodland. A pair of hard-to-see white 'punctuation marks' give this late-flying butterfly its name.


6

Epic journey

In autumn, the sea trout migrates from salt to fresh water, just like its better-known, equally threatened relative, the Atlantic salmon. At first this fish has silvery sides, but as it battles upstream to spawn in the river headwaters, it darkens and resembles a brown trout.


7

Fab fungus

A flash of bright orange on the woodland floor in November may not be the carelessly discarded skin of an orange but the aptly named orange peel fungus. Its fleshy fruiting bodies can be spotted among fallen leaves throughout the autumn and sometimes even in winter.

FLYING EGRET: DAVID TIPLING/NATUREPL.COM; STANDING EGRET: CHRIS GRADY/ALAMY; BUTTERFLY: ANDY SANDS/NATUREPL.COM; SALMON: GRAHAM EATON/NATUREPL.COM; FUNGUS: DUNCAN McEWAN/NATUREPL.COM

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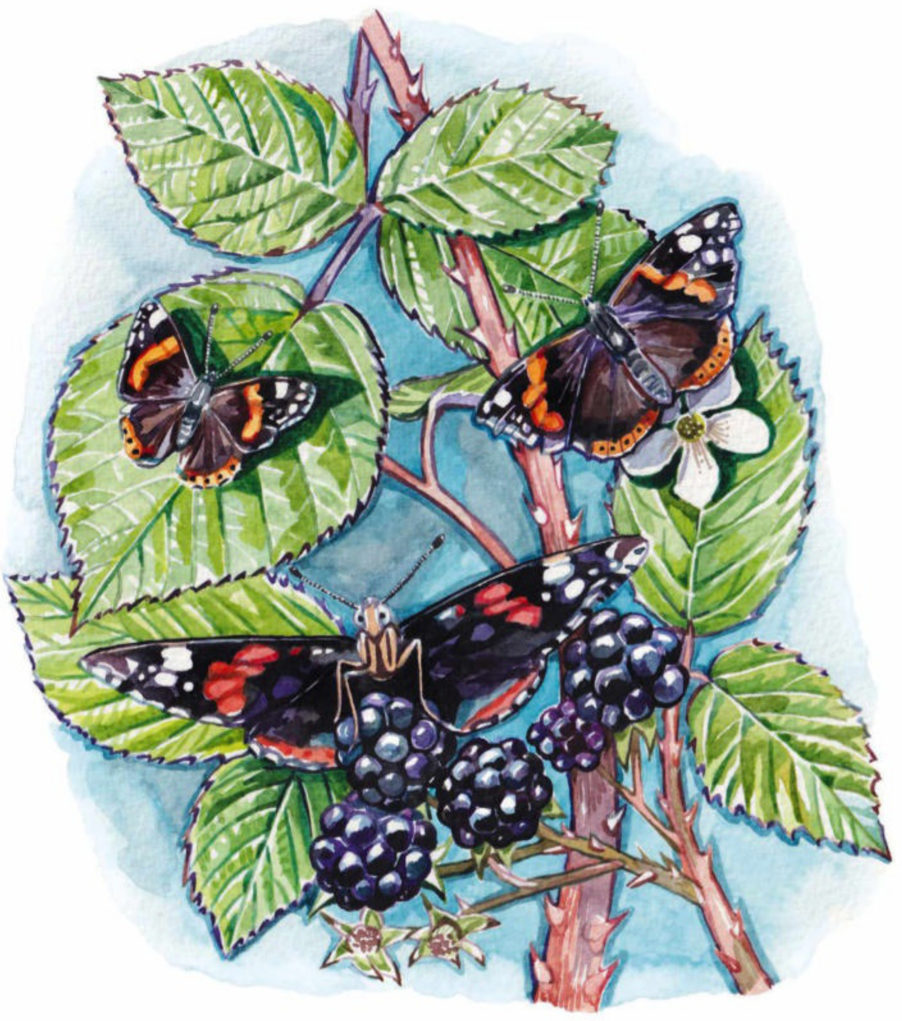

ILLUSTRATION BY HOLLY EXLEY

NOTES ON NATURE

KATE BRADBURY

> “Now, some red admirals stay for winter instead of migrating south”

“On a mild autumn day I might catch a red admiral butterfly taking the last of summer’s nectar, basking in sunshine or flying among the rooftops against a brilliant blue sky. I keep a mental log of my last butterfly sighting of the year, which soon becomes my first butterfly of the new year. Both are always a red admiral.

It wasn’t very long ago that the red admiral was strictly a migrant species here, arriving from continental Europe and North Africa in spring, and leaving again in autumn, our winters too cold for them to survive. Now, owing to climate change, some stay for winter instead of migrating south. They don’t seem to hibernate in the same way as other butterflies, such as the small tortoiseshell and peacock, which enter a more consistent dormant state. So it’s common to see them on mild, sunny days, delighting those of us looking for a glimpse of spring.

At this time of year, you might see red admirals on ivy flowers or late-summer garden favourites, such as rudbeckia or *Verbena bonariensis*. These handsome insects also continue breeding in winter – look closely in a patch of nettles and you may still find their caterpillars sheltering in folded-over leaves.

It’s been a good year for red admirals, and for other butterflies, too – a welcome relief after Butterfly Conservation declared a ‘butterfly emergency’ in 2024, officially one of the worst years on record for butterflies. Both 2023 and 2024 were too wet and cold for these sun-loving insects, which need warmth to be able to fly and find a mate. Last year, my garden flowers seemed empty and lifeless without them, and the big banks of nettles I walk past on the South Downs were devoid of caterpillars.

But this year has been better, with butterflies and caterpillars everywhere, a sure sign that the hot, dry weather has enabled the adults to disperse, find mates and lay eggs. Yet while the sunshine and dry conditions have been perfect for the adults, the lack of rain may have caused problems for their offspring.

Caterpillars need fresh green leaves to eat, not shrivelled, dry ones. After the drought of 1976, butterfly numbers dropped significantly. This was to do with the lack of rain, rather than the heat, as foodplants dried up and caterpillars starved. The crash came in 1977 (one year’s caterpillars are the next year’s butterflies, after all), which happened to be a wet summer. Similar, though less extreme, population declines were seen after the dry summers of 1995 and 2018.

In the drought year of 2022, I watched a desperate small white butterfly struggle to lay its eggs on a shrivelled charlock plant, and took the eggs home to raise on a supermarket cabbage. Fresh new adults emerged successfully a couple of weeks later. That year, ringlet butterflies, which lay eggs on grasses and tend to do better in slightly wetter years, also laid eggs in my garden for the first time, not surprisingly around the moist fringes of my pond.

The wetter years of 2023 and 2024 came after a drought, so there are too many variables at play to know if 2022’s drought contributed to last year’s butterfly emergency. I’m certain it did, but it’s unlikely we’ll ever know for sure.

The truth is, our butterflies have been declining for many years, thanks to a combination of habitat loss and pesticides. And now, climate change is making weather more extreme, and extreme weather more frequent. The milder winters may be changing the behaviour of our red admiral, even helping it to increase its range and population. But what the future holds is, as yet, unclear.

Kate is a wildlife gardening expert and author. Her latest book is *One Garden Against the World* (Bloomsbury).

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WILD IN THE CITY

— WITH DAVID LINDO —

The monk parakeet has been a colourful, not to mention noisy, addition to the cityscapes of Madrid

In cities such as Madrid, monk parakeets build huge communal nests of around 20 nest chambers on top of urban infrastructure

Naturalised parrots have become a familiar feature of urban centres around the world, with some cities being home to multiple introduced species. In the UK, the distinctly irritating screeching of ring-necked parakeets is now commonplace. We nearly had a second introduced species to contend with back in 2011: the monk parakeet. However, it was all but wiped out by the Department for Environment, Food and Rural Affairs (Defra) before numbers got out of control.

Also known as the quaker parakeet, this species originally hails from temperate to subtropical areas of Argentina, Brazil and Uruguay. Deemed to be pests in their natal lands, wild populations of monk parakeets were subjected to unlimited exploitation by a burgeoning wild bird trade, with millions transported to homes worldwide since the 1960s. As with the more familiar ring-necked parakeet, the eventual global feral populations of this species are down to escapees and deliberate small-scale releases.

Monk parakeets are still common within their natural range and continue to be regarded as major agricultural pests. Interestingly, it is their breeding habits that set them apart from all of the other 400-plus parrot species. They are the only members of the family to build their own nests. The structures are messy stick affairs, huge colonial nests with separate entrances for each pair, that are built in trees or atop human-made structures such as telegraph poles. These parrot apartment blocks can sometimes be the size of a small car. Herein lies the problem. The nests are fire risks and local authorities are petrified of the nests collapsing and falling onto people below.

There are self-sustaining populations in cities across the world, from North America and Europe to South Korea and Japan. Their survival rates have increased from 61 per cent in their natal lands to upwards of 80 per cent in cities such as Madrid. They are much more likely to have successful second broods in their adoptive cities, laying up to eight eggs. Then there's the bird's lifespan. In true parrot fashion, it is long-lived, with individuals sometimes popping their clogs well into their thirties.

Originally a woodland species, city living has obviously come naturally to this noisy bird. I have watched them busily scoffing fruit from street trees in Madrid and foraging for scraps alongside bemused pigeons. Indeed, it is Spain's capital that has the biggest population of monk parakeets in Europe. Originally introduced in the 1980s, the population was estimated to have grown to around 18,000 individuals in 2021, their numbers presumably bolstered by released birds when ownership of this species was banned in 2011. They certainly haven't been greeted with smiles and cheers in the city.

In 2019, amid fears that their rapidly growing numbers were detrimental to native avifauna (especially house sparrows), and concern about the damage they caused due to the excessive stripping of vegetation for nests, the city council decided on a humane cull – initially via egg sterilisation. This led to fierce opposition from animal rights groups. To date, the control campaign has met with limited success. So, it looks like this little South American squawker will continue to be a high-profile resident of Madrid, whether the locals like it or not.

David Lindo, AKA the Urban Birder, is a naturalist, broadcaster and author of many books, including *Fly: A Child's Guide to Birds* (Magic Cat Publishing)

MONK PARAKEETS: AGAMI PHOTO AGENCY/ALAMY

Mike Dilger's

WILDLIFE SPECTACLES

The broadcaster, naturalist and tour guide shares the most breathtaking seasonal events in the world

SAND ON MY FEET

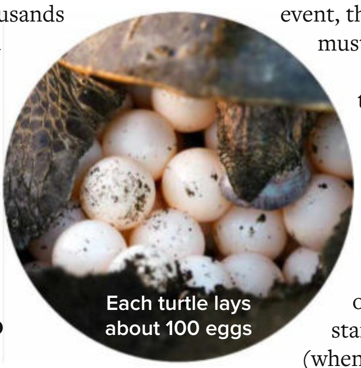
TURTLES' MASS ARRIVAL

Thousands of turtles emerge from the ocean to lay their eggs – but only a handful of hatchlings will make it

Ask any turtle biologist from any country as to the meaning of *arribada* and chances are their eyes will glaze over, before they begin gushing effusively about the synchronised transition from sea to sand of thousands upon thousands of marine turtles that have a sole purpose in mind.

To those without the benefit of either a grounding in Spanish or an understanding of the basic ecology of marine reptiles, *arribada* simply means arrival – in this case, the arrival of olive ridley sea turtles (and, to a lesser extent, Kemp's ridleys) to a few special beaches along the coasts of Costa Rica, Mexico and Nicaragua. After reaching their destination, the turtles will leave the sanctuary of the sea for a mass egg-laying event, the sheer size of which must be seen to be believed.

Primarily occurring in the middle of Costa Rica's wet season, between August and November, the biggest and best arrivals tend to be dictated by the lunar cycle, with peaks occurring between the start of the third quarter (when the moon is half-illuminated) and the darkness associated with a new moon. Perhaps the most celebrated location to catch the *arribada* is at Ostional beach on Costa Rica's Pacific coast, where peak events can



Each turtle lays about 100 eggs

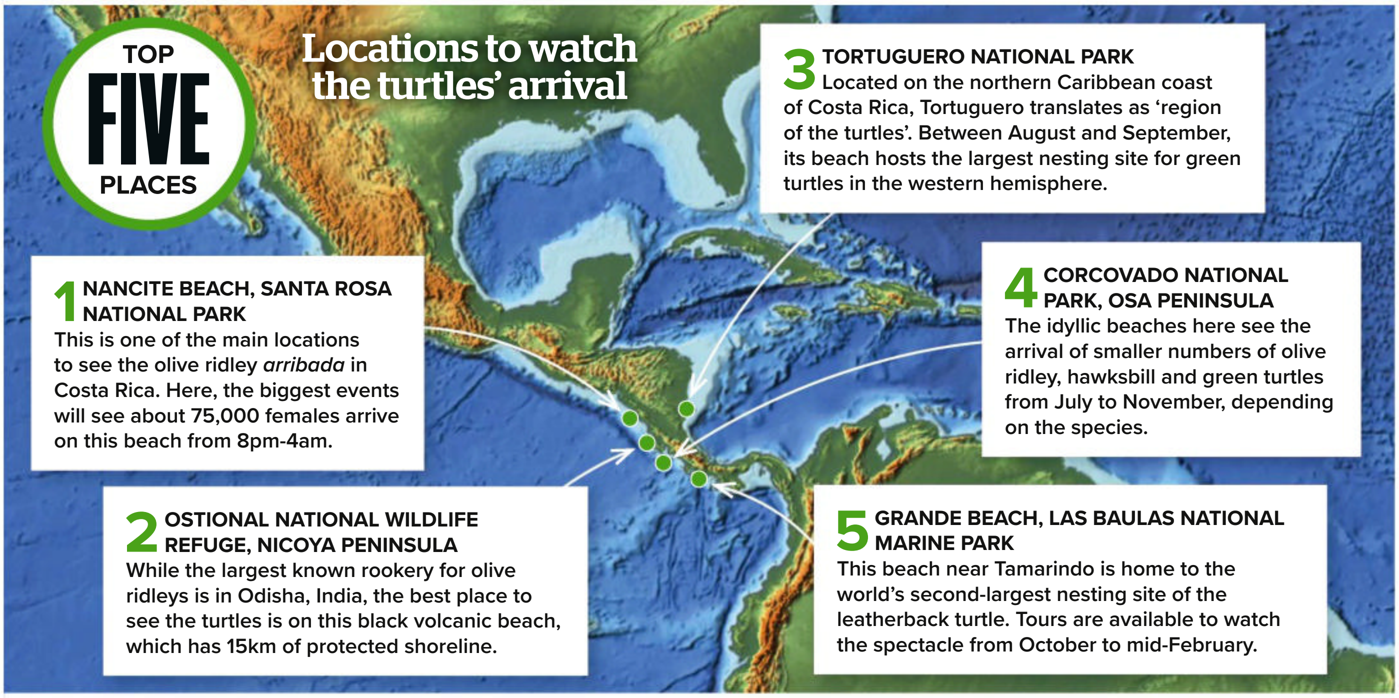
Did you know?

Olive ridley hatchlings are about 40mm long and weigh 17g at birth. If they are lucky enough to survive their sprint to the sea, it is thought they spend their first few years floating in currents and foraging for plankton.

Only one in a thousand olive ridley hatchlings reach adulthood

LORA TURTLE AND EGGS: YURI CORTEZ/GETTY; HATCHLINGS ON BEACH: ADRIAN HEPWORTH/ALAMY

> “The most celebrated location to catch the *arribada* is at Ostional beach on Costa Rica’s Pacific coast”



TOP FIVE PLACES

Locations to watch the turtles' arrival

1 NANCITE BEACH, SANTA ROSA NATIONAL PARK
This is one of the main locations to see the olive ridley *arribada* in Costa Rica. Here, the biggest events will see about 75,000 females arrive on this beach from 8pm-4am.

2 OSTIONAL NATIONAL WILDLIFE REFUGE, NICOYA PENINSULA
While the largest known rookery for olive ridleys is in Odisha, India, the best place to see the turtles is on this black volcanic beach, which has 15km of protected shoreline.

3 TORTUGUERO NATIONAL PARK
Located on the northern Caribbean coast of Costa Rica, Tortuguero translates as 'region of the turtles'. Between August and September, its beach hosts the largest nesting site for green turtles in the western hemisphere.

4 CORCOVADO NATIONAL PARK, OSA PENINSULA
The idyllic beaches here see the arrival of smaller numbers of olive ridley, hawksbill and green turtles from July to November, depending on the species.

5 GRANDE BEACH, LAS BAULAS NATIONAL MARINE PARK
This beach near Tamarindo is home to the world's second-largest nesting site of the leatherback turtle. Tours are available to watch the spectacle from October to mid-February.

see the arrival of around 300,000 gravid female olive ridleys in just a few days.

While the precise origins of the word 'ridley' are uncertain, the 'olive' part undoubtedly refers to the colour of the turtle's heart-shaped shell. The ridley species are the smallest of the world's seven species of sea turtle. Of the two, the olive ridley is the most widespread, as it can be found across the tropical regions of all three great oceans.

Considered a mostly pelagic (or open ocean) species, having been observed at more than 3,800km from land, olive ridleys do also inhabit coastal areas. Their varied diet includes crustaceans, molluscs, jellyfish and algae. They can easily live to 50 years old, reaching sexual maturity at the age of 10 to 15. And while other turtle species have been documented to 'nest' in groups, only the ridleys appear to do mass egg-laying.

Returning to the site where they too hatched, the turtles will wait in the shallows for nightfall before leaving the water in waves (both physically and metaphorically). They then move high up the beach, where each turtle digs a shallow hole before laying around 100 rubbery eggs that look like ping-pong balls. Once the clutch is complete, the female uses her body to cover the eggs with sand and then returns to the water. Witnesses of the spectacle have said that the turtles appear to be in a trance-like state for their entire time away from the sea.

> "Witnesses have said that the turtles appear to be in a trance-like state"

At Ostional, with so many turtles coming ashore on a relatively small section of beach, a large proportion of the earliest clutches are destroyed by the later females either trampling the eggs or unearthing them while making their own deposits. And during the incubation, even more eggs are lost to dogs, racoons, crabs and even ants. But for those clutches left undisturbed, another wave of activity occurs around 45 days later as the hatchlings start sticking their heads out of the sand. It's a brutal world and many of these baby turtles will simply serve as cannon fodder. But in their favour is the beauty of the synchronous laying strategy that gradually becomes apparent – any predators lying in wait quickly become overwhelmed by the sudden emergence of a veritable army of hatchlings.

The tiny turtles' perilous haul across the sand is akin to a marathon across the world's most dangerous obstacle course but many make it to the water. In fact, the journey is vital for expanding their lungs and honing their homing instincts – a skill those who reach adulthood will need to return.

A female olive ridley turtle comes ashore and makes her way up the beach to nest

LOOK CLOSER

The turtle code of conduct

A visit to a nesting site contributes to the conservation of turtles, but it is important to choose a reputable tour operator and guide. They will ensure small group sizes and keep you informed about the rules and regulations – such as no flash photography, wearing dark clothes and keeping at least 1.5m from the turtles.

Turtle egg omelette?

Green turtle

Uniquely in Ostional, locals can take and sell turtle eggs during the first 36 hours of an *arribada*. It's controversial but long-term studies suggest the population can sustain a controlled harvesting. In return, villagers clean the beach and patrol for poachers.

Record breaker

November 1995 saw the largest ever recorded *arribada* in Ostional, with up to 500,000 females estimated to have come ashore in a single event.

NEXT MONTH

The best way to go about spotting a puma in Patagonia

OLIVE RIDLEY TURTLE: TUI DE ROY/NATUREPL.COM; GREEN SEA TURTLE: IMAGEBROKER.COM/ALAMY; PUMA: PANORAMIC IMAGES/ALAMY

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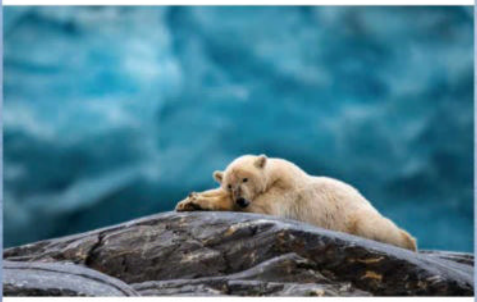

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Nick Baker's

HIDDEN WORLD

The popular naturalist, author and TV presenter reveals a secret realm of overlooked wildlife

AS THE WORM TURNS

CAECILIAN

It looks like a big worm – but has teeth, tentacles and a pseudo penis

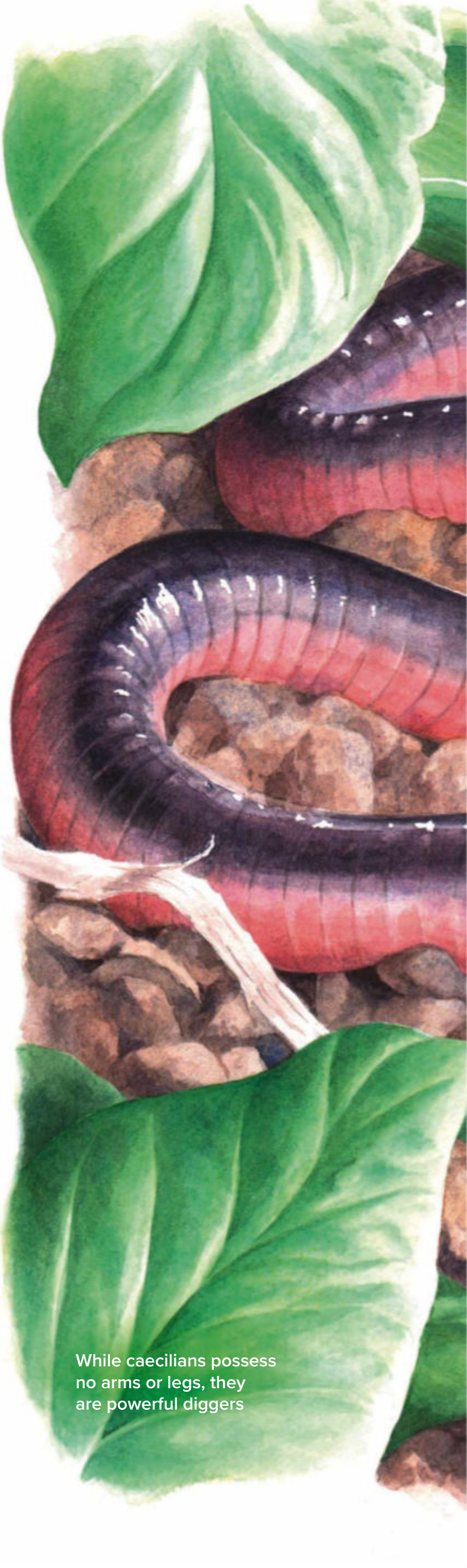
It was soft, rubbery and lubricious, a humongous earthworm to the untrained eye. I was pretty happy with my find until the joy of the moment was momentarily ruined when the 'worm' turned. It opened its mouth and sank its teeth into me. "Ow! It bites!" I didn't expect a mouth, let alone one lined with teeth. But it seems there's nothing typical about caecilians. That creature making a squirming getaway into the swampy vegetation by my feet is one of the oddest and most overlooked of all amphibians.

Say 'amphibian' and most folk think of frogs, toads and salamanders, the mostly leggy, lively, surface-living orders of their class. The secret caecilians, in contrast, are often forgotten, remaining hidden beneath the litter and soil and in the swampy waters of the world's warmer and wetter places. A habit that means the 220-odd (in more ways than one) species are rarely seen by anyone but the most determined.

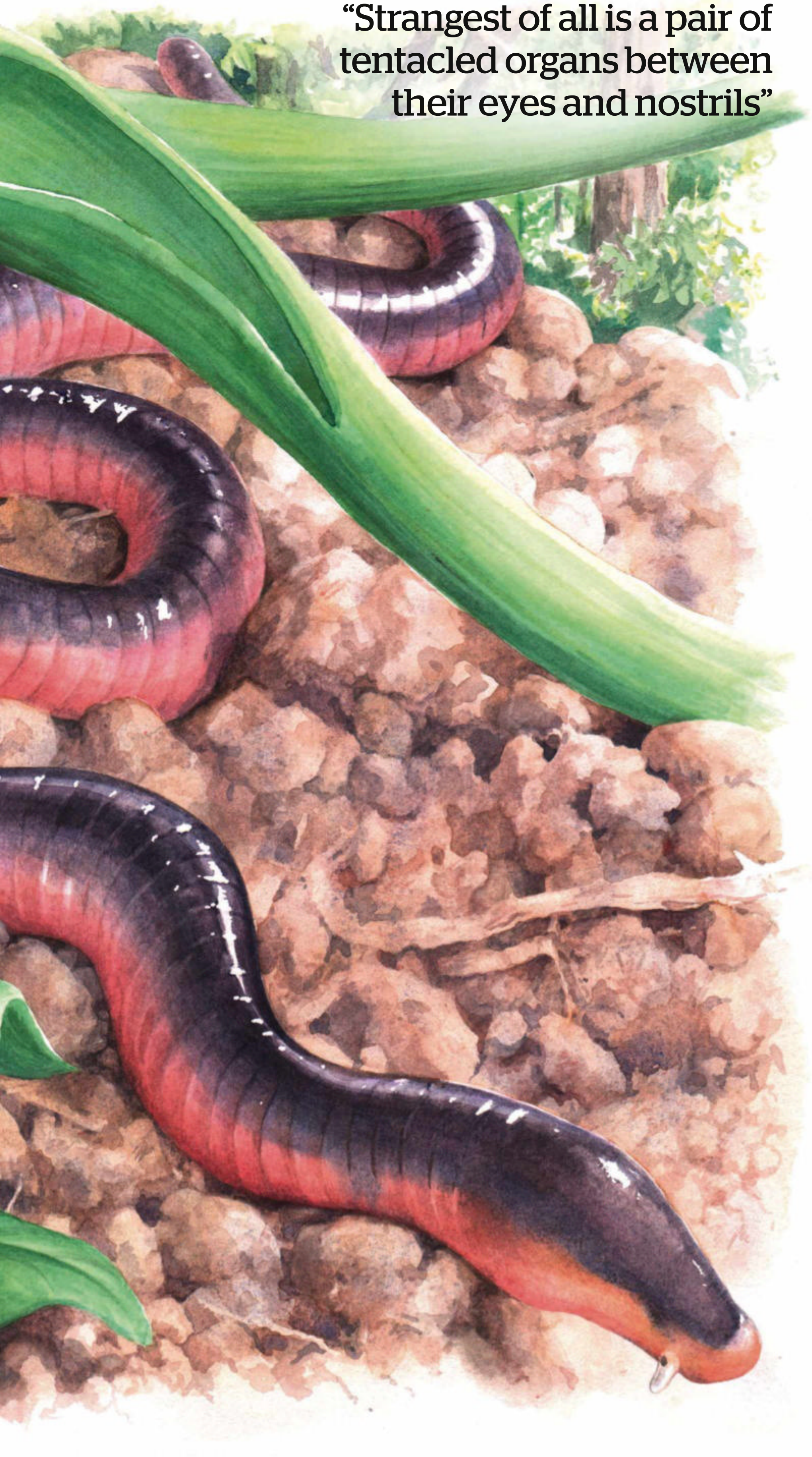
There is a lot about caecilians that is weird. In addition to having a thin, permeable skin, they appear to have very little in common with other amphibians or indeed other animals. Their simple bodies have no clear demarcations that suggest a head, torso or abdomen. They lack limbs, a few are missing tails and, if they've got eyes at all, they're not very well developed – the name caecilian translates from Latin as 'blind one'.

The fact that they have jaws with several rows of formidable jagged teeth is not even the half of it. They have recently been identified as the only amphibian to possess venom glands, too. These supply grooves in their teeth – perfect for grabbing and overpowering slippery or challenging prey. Some give birth to live young, which develop inside their mothers, each with huge gills that act like placentas while they are growing, only to be shed on birth. The males even have a 'pseudo penis'-like organ for inseminating the females, and they all have a pair of unique sensory organs called tentacles. Teeth, tentacles, venom and a phallodeum! Where to start?

The simple, worm-like body is a tried-and-tested design in nature. Smooth, streamlined and well-muscled, they have no appendages to get in the way, making them highly efficient for a skulking and burrowing lifestyle. Most amphibians have delicate skulls composed of a collection of loosely articulated, thin bones. Caecilians are the



While caecilians possess no arms or legs, they are powerful diggers



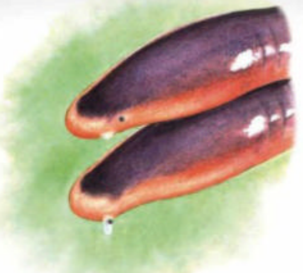
“Strangest of all is a pair of tentacled organs between their eyes and nostrils”

opposite: theirs are solid, with thick bones fused to form the perfect device to push their way through their environment as well as anchor the powerful jaw muscles.

The lack of complex eyes – most have at best a small, simple eye, deeply embedded in the skin – means there is nothing delicate to damage. And besides, where they reside in the realm of dinginess and dank, they don’t really need them. Instead, their body surface is equipped with multiple sensory organs, which include a fish-like lateral line in some species. Strangest of all, though, is a pair of tentacled organs between their eyes and nostrils, which are thought to be used for tasting and sensing the environments around them.

But it’s with their maternal care plan that things get seriously weird, in particular with some of the egg-laying species. Maternal care is already an unusual quality in an amphibian – not many look after their young. But some caecilian mothers feed their young a nutritional ‘milk’ produced by glands on the surface of her skin. It gets weirder still in some members of the Herpelid and Siphonpidae families. These go in for a behaviour called ‘maternal dermatophagy’. This is where the shark-mouthed babies take mouthfuls out of their mothers flanks. While her offspring are growing, she helps them out by developing a special outer layer of skin rich in nutrients. This is constantly replaced, allowing the newly hatched juveniles to gain more than 10 times their original weight in a week. Now that’s some parenting.

LOOK CLOSER



It’s the only tetrapod that can pop its eyes out

Roving eye

A family of African caecilians, the Scolecomorphids, have their eyes and tentacles so closely positioned that when the tentacle is extended, their eyes move out of their socket in the skull and down the tentacle itself. A small pigment-less area of skin in the tentacles allows the light to reach the retina.

ILLUSTRATIONS BY PETER DAVID SCOTT/THE ART AGENCY

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CALL OF THE WILD

Famous national parks, awe-inspiring scenery and world-class wildlife watching in Alberta, Canada

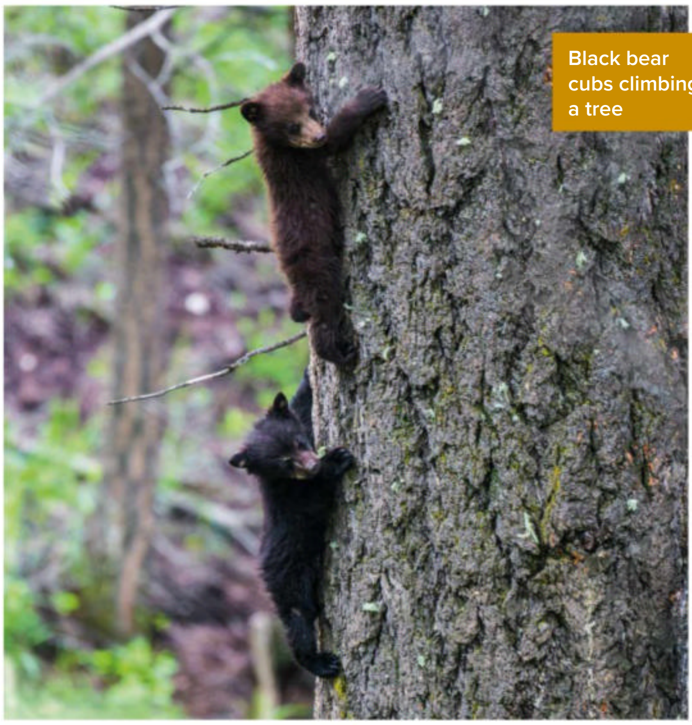
Home to the Canadian Rockies – the northern portion of the continent-spanning Rocky Mountains – Alberta does not disappoint when it comes to jaw-dropping vistas. But travel to this region of Canada and you'll be met with much more than views. Prepare to discover a natural history spanning tens of thousands of years, from the dinosaurs that once roamed Alberta's landscapes to the near-600 species of animals living here today. Plus, direct flights from the UK to Calgary make it easier than ever to reach this incredible place.

NATIONAL TREASURES

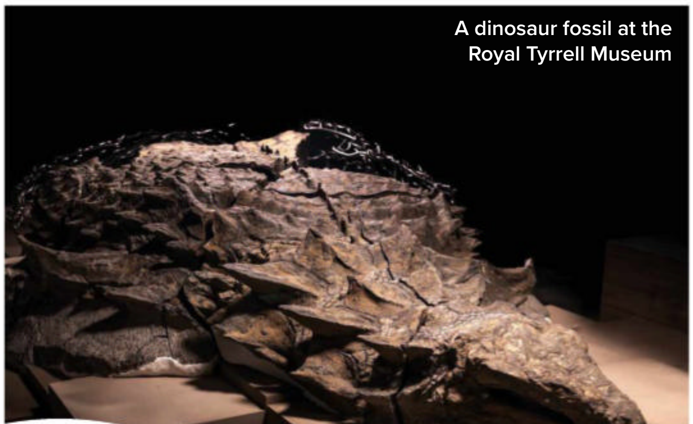
From the snow-capped mountains and glacial lakes of Banff and Jasper National Parks to the archaeological history of Dinosaur and Midland Provincial Parks, Alberta is famous for its protected landscapes. There are five national parks and over 460 provincial parks in this region of Western Canada, each with unique natural landmarks and geology. Go hiking in the Canadian Rockies, learn about dinosaur fossils in the Canadian Badlands, enjoy birdwatching in the Lakelands and immerse yourself in Indigenous culture throughout the province. Get to know the parks intimately with specialist guided tours in wildlife watching, stargazing, hiking, kayaking and more. Or plan an unforgettable road trip visiting several of Alberta's parks to appreciate the remarkable diversity across the region.

NATURE'S SANCTUARY

The park systems of Alberta protect nearly 600 species of animals, including some iconic



Black bear cubs climbing a tree



A dinosaur fossil at the Royal Tyrrell Museum

Lynx in the snow at Rainbow Lake

North American creatures. Visit the parks of the Canadian Rockies for the chance to see grizzly bears, black bears, wolves, moose, elk and more in the wild. Stop by Elk Island National Park for incredible birdwatching – the wetland and grassland landscapes house over 250 species of birds. Or head north to Wood Buffalo National Park to see the largest free-roaming wood bison herd in the world. Don't miss the national animal of Canada – the North American beaver – which can be found at the Beaver Boardwalk in Hinton. For most species, optimal viewing is usually during spring and autumn. In spring, it's possible to observe feeding behaviours in bears and other hibernators, and in autumn, witness the rutting season for elk and other ungulates.

LAND OF GIANTS

With some of the richest fossil beds in the world, the Badlands region of Alberta is a dream destination for dinosaur devotees. Around 40 different species of dinosaur have been discovered here, including the fearsome Albertosaurus – a smaller but no less deadly cousin of T. Rex. Visitors can get up close to these ancient specimens at Dinosaur Provincial Park, a UNESCO World Heritage Site, where real fossil digs take place year-round. For a deeper dive, the Royal Tyrrell Museum in Drumheller boasts one of the world's most extensive dinosaur fossil collections, with hands-on experiences including behind-the-scenes lab tours and excavation programmes. Stop by the Philip J. Currie Dinosaur Museum in Wembley for a unique chance to explore the infamous Pipestone Creek – also known as the 'River of Death' – one of the highest density mass fossil sites on Earth. Here, visitors can take part in real-life digs, join guided hikes or even enjoy a Night at the Museum sleepover experience.

GUIDED BY LOCALS

The best way to experience Alberta's incredible landscapes and wildlife is with the people who live and work there. Locally-owned tour operators offer a breadth of experiences: go on a photography tour in Jasper National Park, looking for bears and moose, or paddle the jewel-coloured waters of Lake Louise in Banff National Park.

Learn about rare wildflowers on a guided hike in Waterton Lakes National Park or go horseback riding in the foothills of the Rocky Mountains. Learn about Indigenous culture at Métis Crossing, Alberta's major Métis cultural destination, where visitors can hear traditional stories, learn local crafts and stay overnight in stargazing domes. You can also immerse yourself in Indigenous culture by visiting one of the historical parks in Calgary or Edmonton, see interpretive art, go on a guided medicine walk and discover delicious local cuisine.

ADVENTURE AWAITS

Extraordinary landscapes, abundant wildlife, Indigenous culture, world-famous dark skies and a fascinating prehistoric past. If you're looking for adventure, Canada's Alberta is the ideal destination to discover your wild side. It's easy to travel here from the UK, with direct flights from London to Calgary, Alberta's largest city, and getting around is hassle-free too. The province lends itself to multi-day road trips – simply rent a car, choose a tried-and-tested itinerary and start exploring.

The Alberta History of the Land self-drive itinerary from travel experts Canadian Affair includes many of the locations and experiences featured. Alternatively, their specialists will create the perfect Alberta itinerary to your exact requirements.

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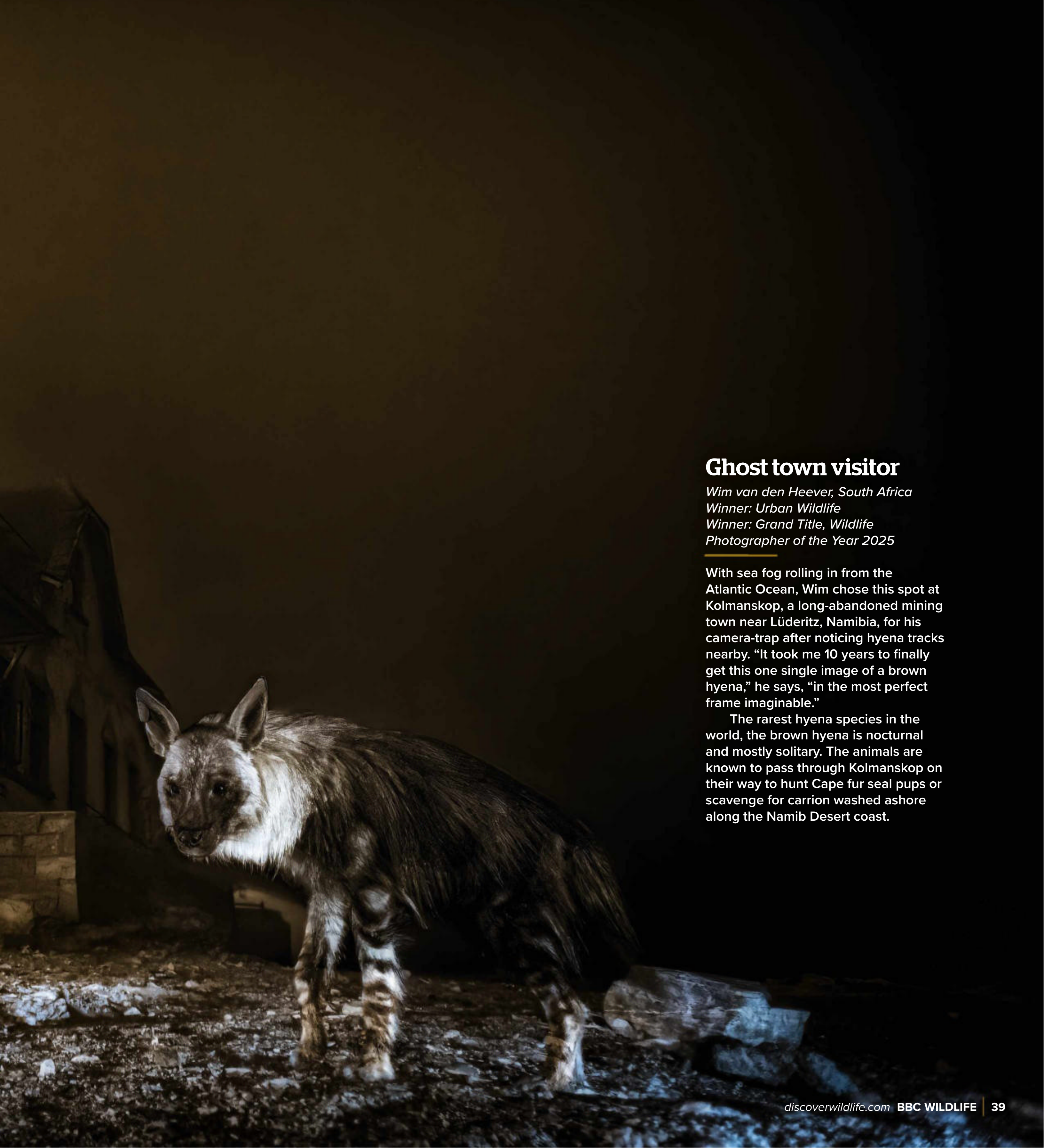
APHER OF THE YEAR



Ghost town visitor

Wim van den Heever, South Africa
Winner: Urban Wildlife
Winner: Grand Title, Wildlife Photographer of the Year 2025

With sea fog rolling in from the Atlantic Ocean, Wim chose this spot at Kolmanskop, a long-abandoned mining town near Lüderitz, Namibia, for his camera-trap after noticing hyena tracks nearby. "It took me 10 years to finally get this one single image of a brown hyena," he says, "in the most perfect frame imaginable."

The rarest hyena species in the world, the brown hyena is nocturnal and mostly solitary. The animals are known to pass through Kolmanskop on their way to hunt Cape fur seal pups or scavenge for carrion washed ashore along the Namib Desert coast.

PORTFOLIO

Cat among the flamingos

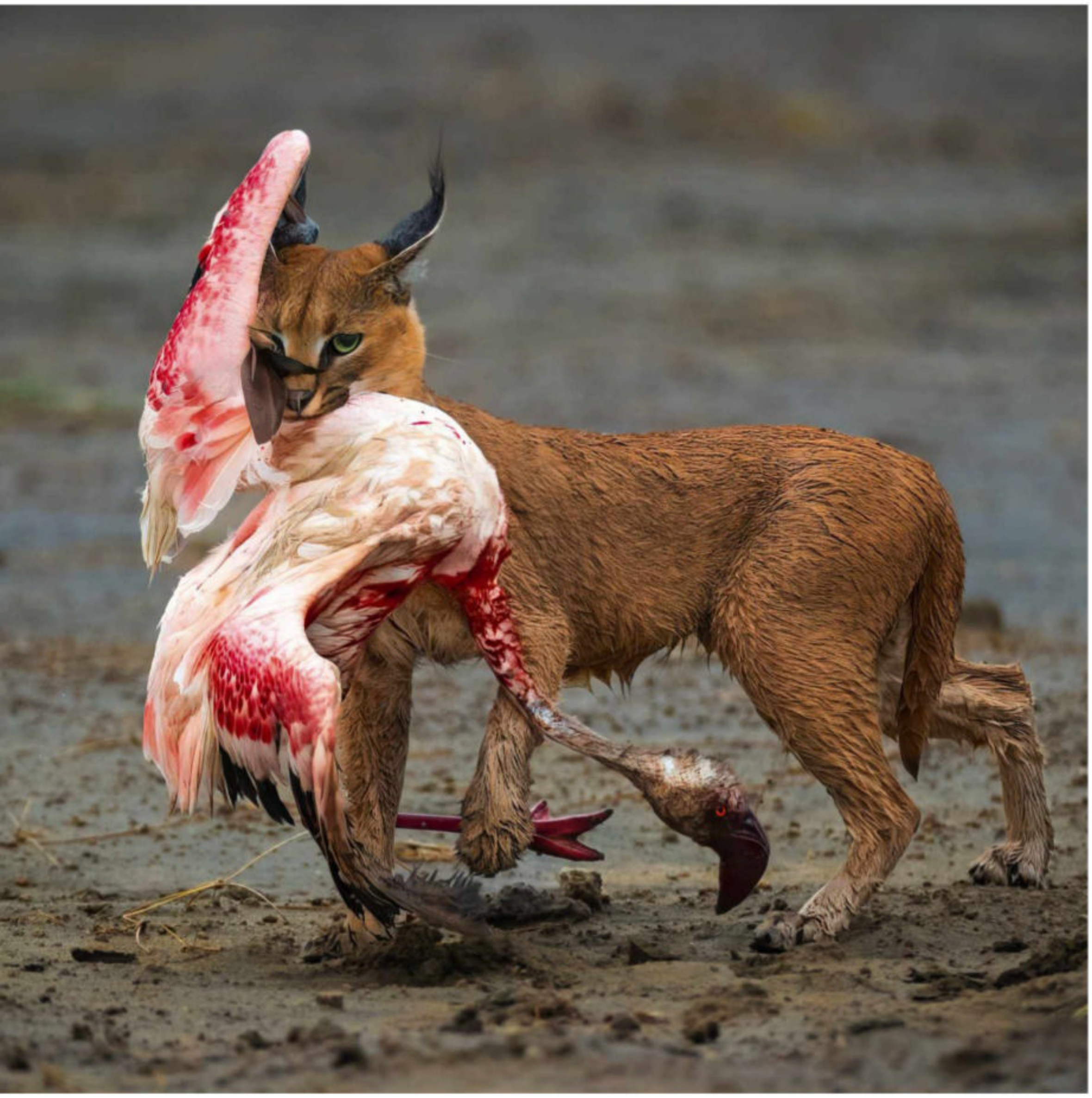
Dennis Stogsdill, USA
Winner: Behaviour, Mammals

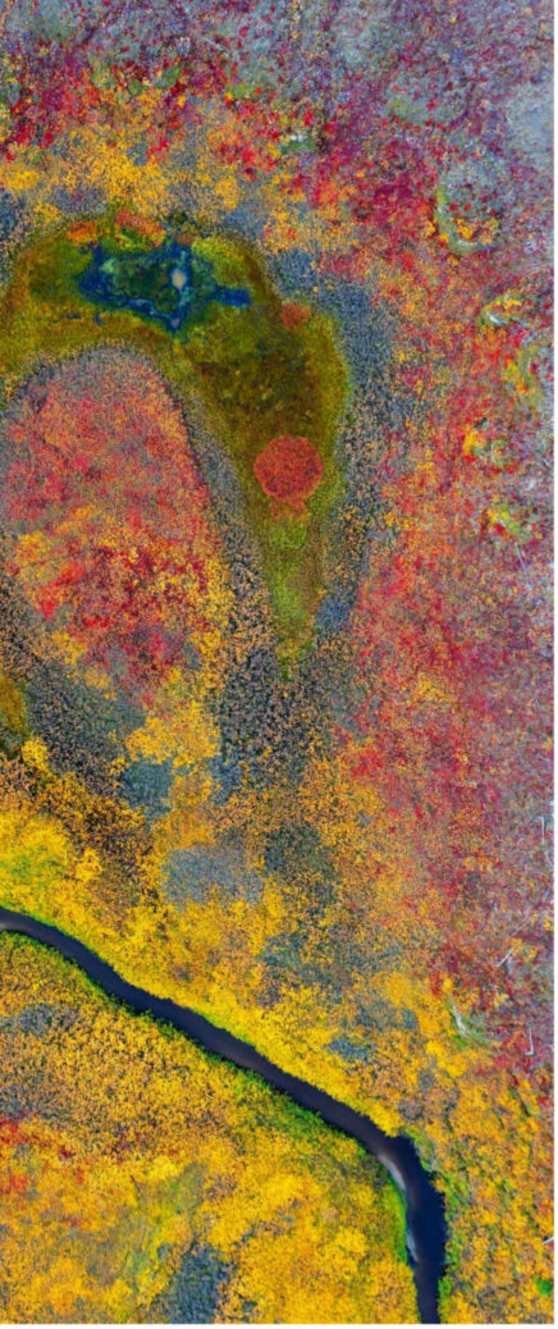
Photographing around Ndutu Lake in Tanzania's Serengeti National Park, Dennis had been keeping an eye out for wild cats when news of a sighting came over the radio. It was a caracal, hunting wading lesser flamingos. Caracals have a varied diet, from insects to antelope, and are renowned for making acrobatic leaps when snatching birds from the air. There are few, if any, records of them hunting flamingos.

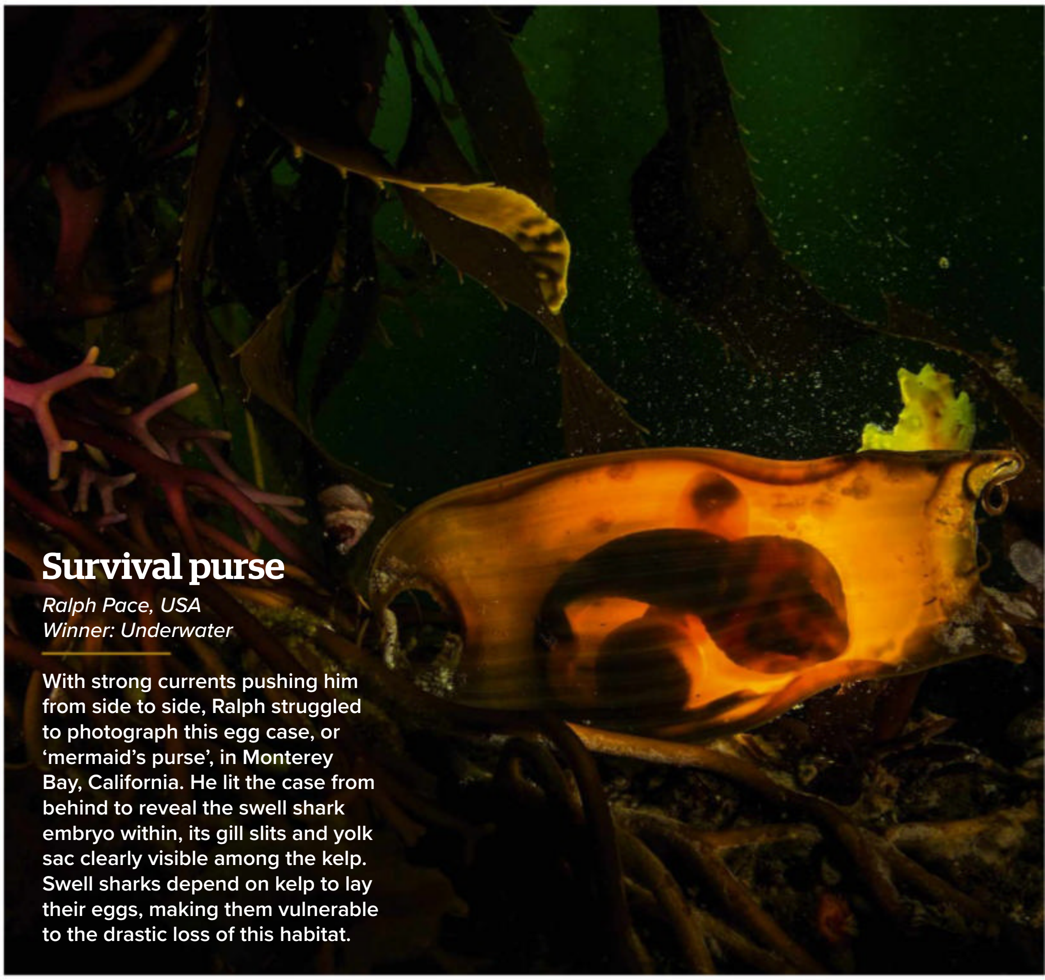
Visions of the north

Alexey Kharitonov, Israel/Russia
Winner: Portfolio Award

Alexey's collection of six images showcases unexpected perspectives of Russia's northern swamps (here, the uninhabited territory along the Taymylyr River), highlighting the change from summer to winter. Using drones, Alexey has picked out details in these vast terrains, capturing their wild beauty through striking compositions. Yet beyond this visual feast lie human-made threats – not least a pressing vulnerability to climate change.



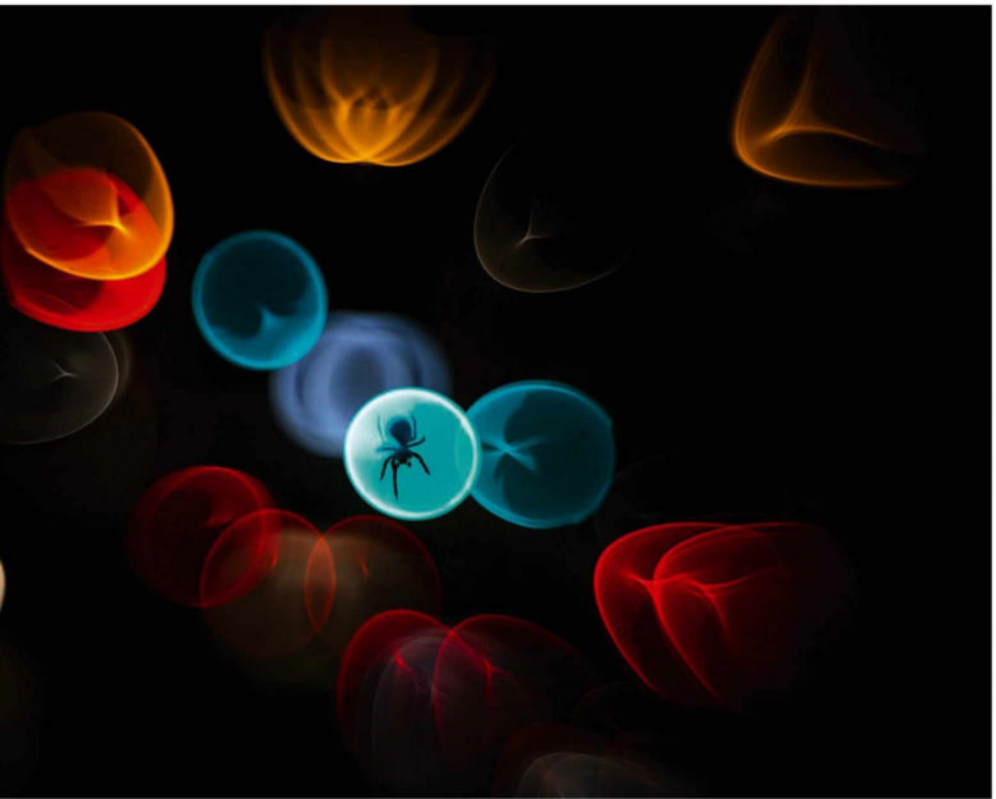




Survival purse

Ralph Pace, USA
Winner: Underwater

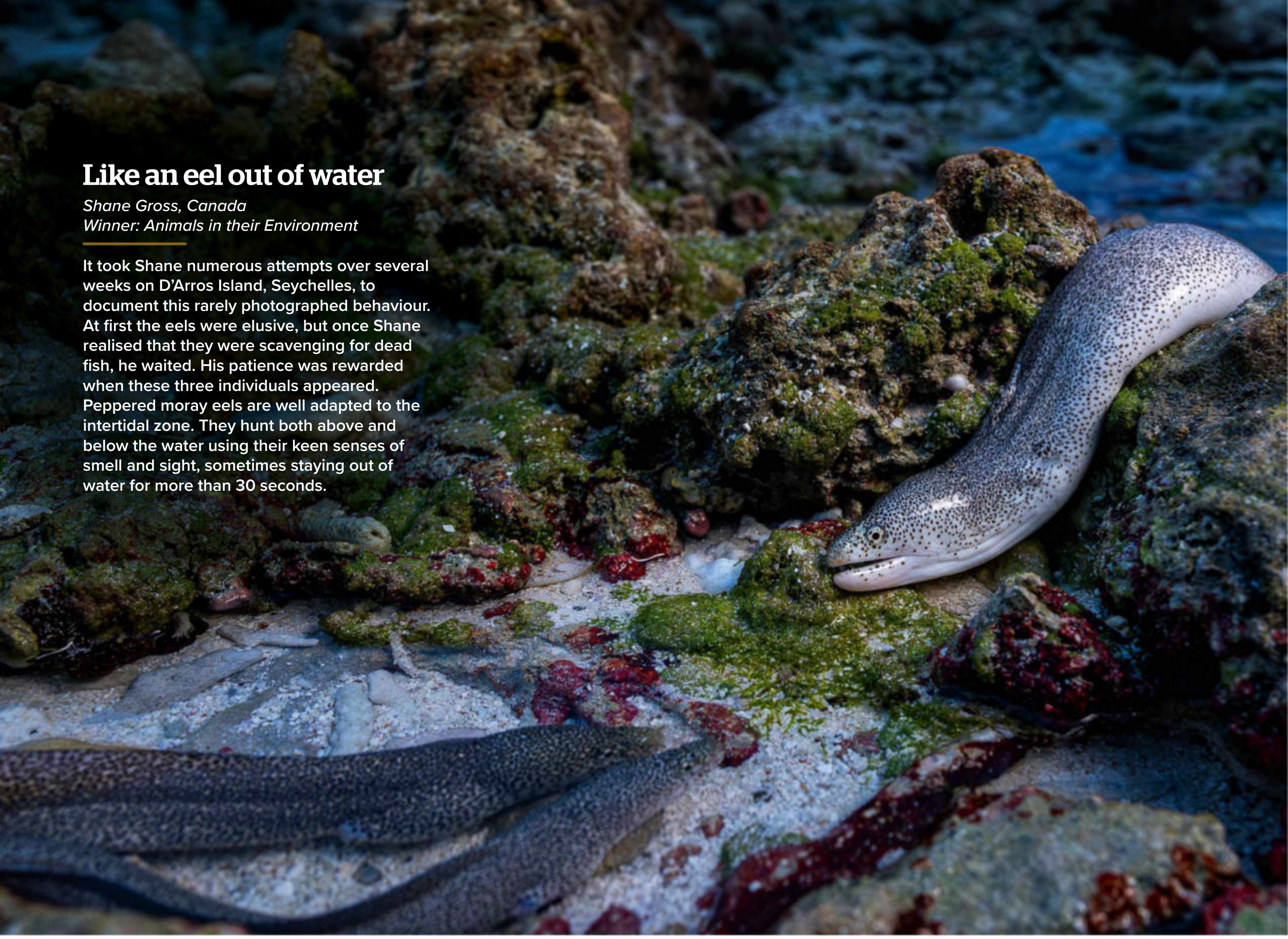
With strong currents pushing him from side to side, Ralph struggled to photograph this egg case, or 'mermaid's purse', in Monterey Bay, California. He lit the case from behind to reveal the swell shark embryo within, its gill slits and yolk sac clearly visible among the kelp. Swell sharks depend on kelp to lay their eggs, making them vulnerable to the drastic loss of this habitat.



Caught in the headlights

Simone Baumeister, Germany
Winner: Natural Artistry

Simone reveals an orb weaver spider in its web on a footbridge in Ibbenbüren, Germany, silhouetted by lights from the cars below. To achieve this kaleidoscopic effect, Simone reversed one of the six glass elements in an analogue lens. This distorted the image at the edges while leaving the centre focused. She then cropped the picture to move the spider off-centre. In urban environments, orb weaver spiders often spin webs near artificial lights that attract insects at night. The web acts as an extension of their sense organ, gathering sound and transmitting vibrations to their legs.



Like an eel out of water

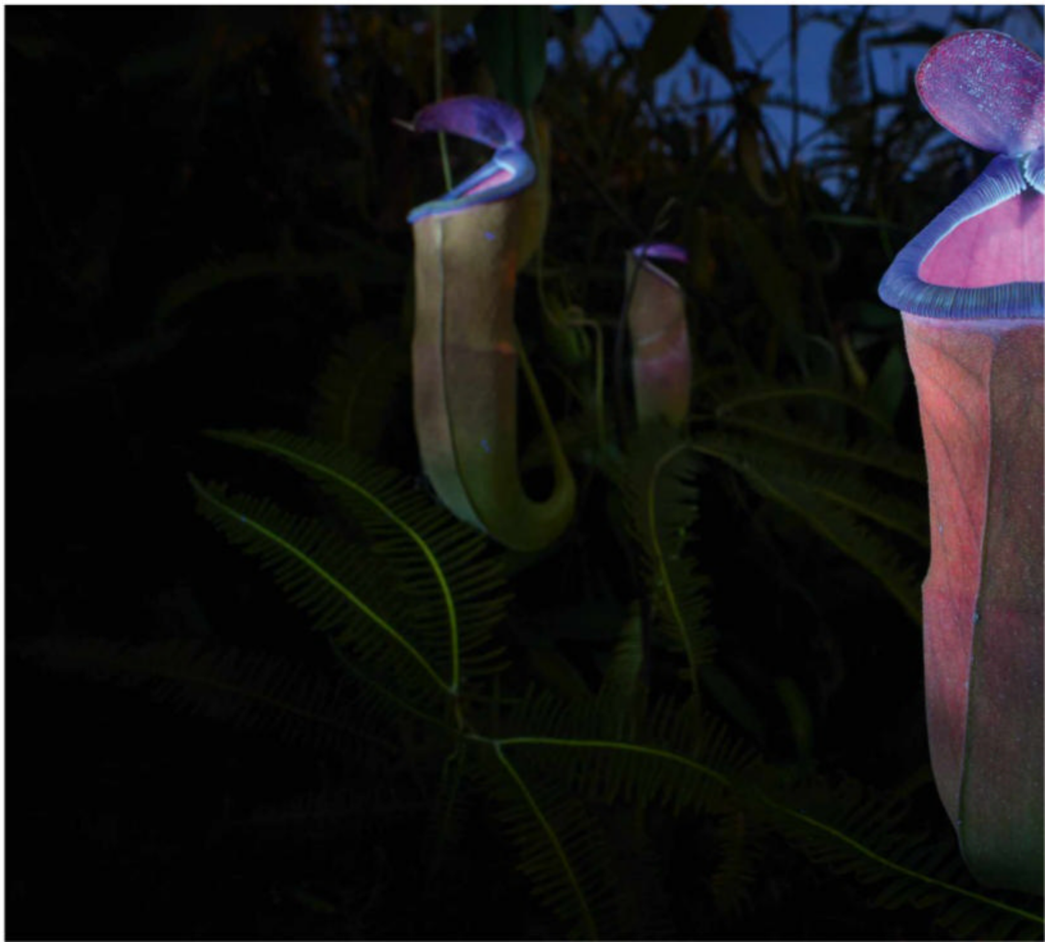
Shane Gross, Canada
Winner: Animals in their Environment

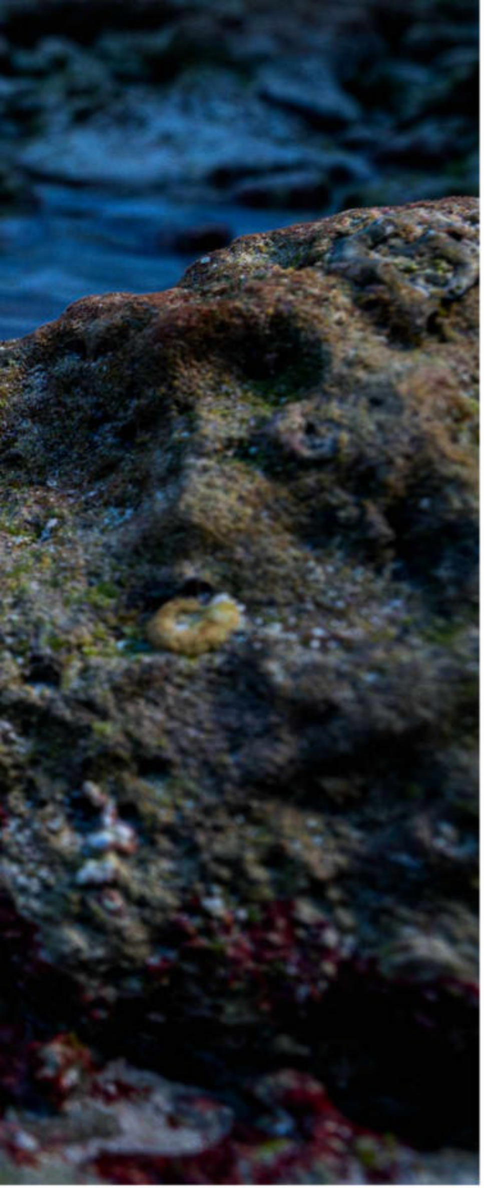
It took Shane numerous attempts over several weeks on D'Arros Island, Seychelles, to document this rarely photographed behaviour. At first the eels were elusive, but once Shane realised that they were scavenging for dead fish, he waited. His patience was rewarded when these three individuals appeared. Peppered moray eels are well adapted to the intertidal zone. They hunt both above and below the water using their keen senses of smell and sight, sometimes staying out of water for more than 30 seconds.

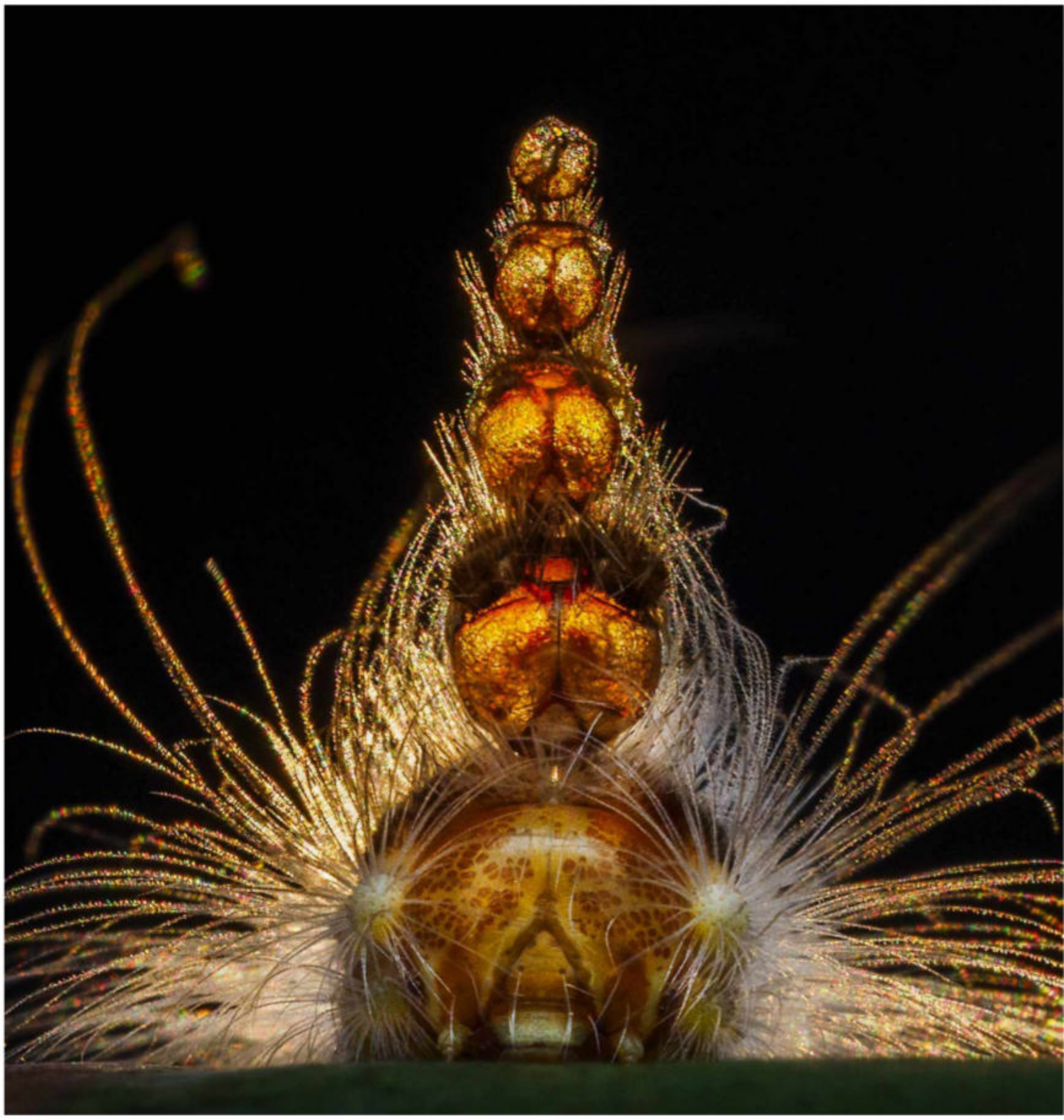
Deadly allure

Chien Lee, Malaysia
Winner: Plants and Fungi

Chien used a long exposure and a UV torch to reveal the fluorescent world of an insect-attracting pitcher plant in Sarawak, Borneo. Working after sunset, he had a five-minute window before the ambient light illuminating the backdrop disappeared. Some carnivorous pitcher plants reflect UV light on certain areas as part of their 'display'. They use colour, scent and nectar to lure prey into pools of digestive juices at the bottom of their leaves.





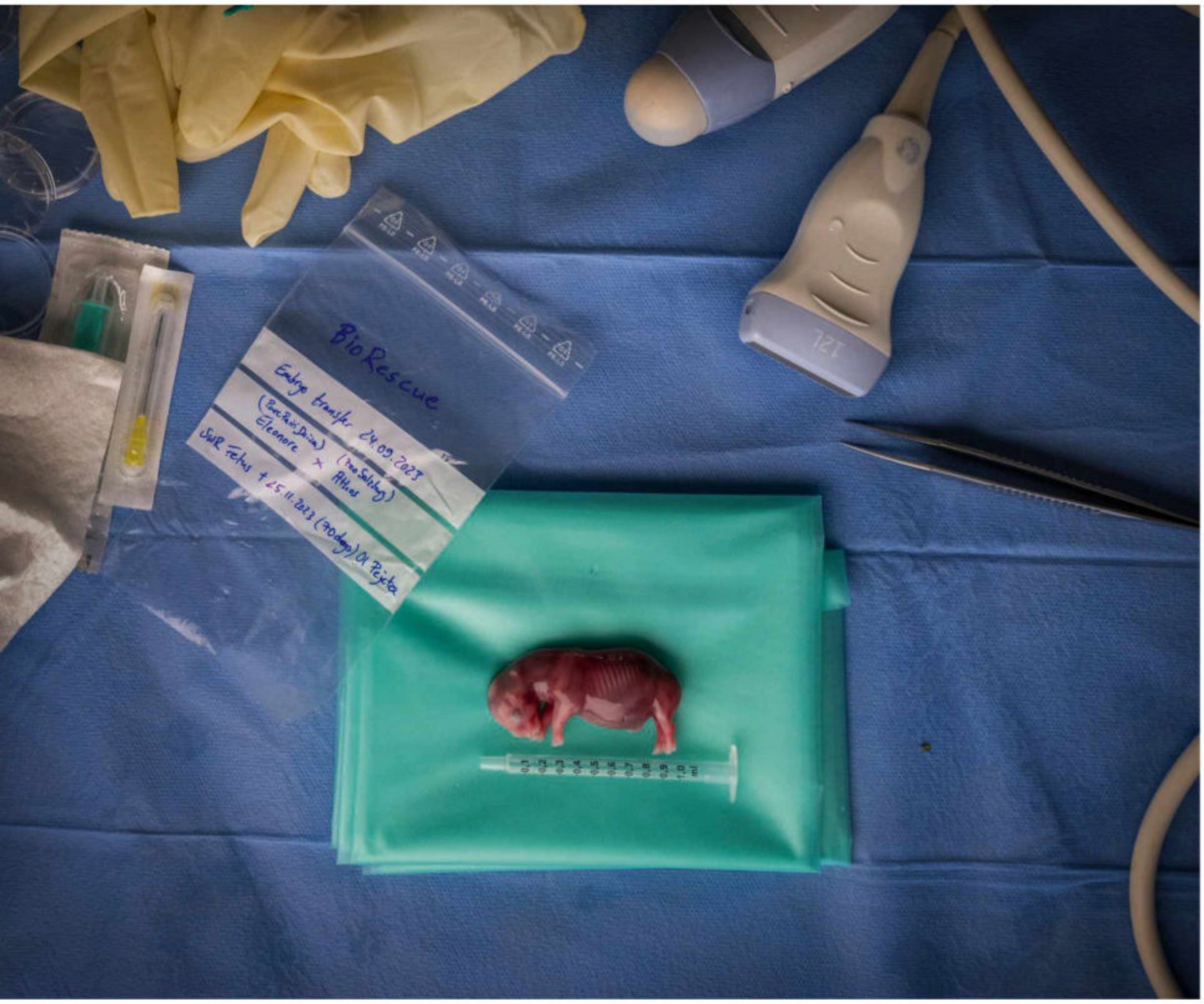


Mad hatterpillar

Georgina Steytler, Australia
Winner: Behaviour, Invertebrates

Georgina had been looking out for the gum-leaf skeletoniser caterpillar for years when, in Torndirrup National Park, Western Australia, she noticed eucalyptus trees bearing skeletonised leaves – a telltale sign of grazing. She took this image backlit by the setting sun, using a fill-in flash to illuminate the living head at the base of the stack. This caterpillar's unusual headgear is made up of old head capsules, retained with every moult. The resulting 'tower' is thought to deter predators.

PORTFOLIO


BioRescue
Embryo transfer 24.09.2023
Eleonore × Athos
SWR Fetus † 25.11.2023 (70 days) Ol Pejeta
12L

How to save a species

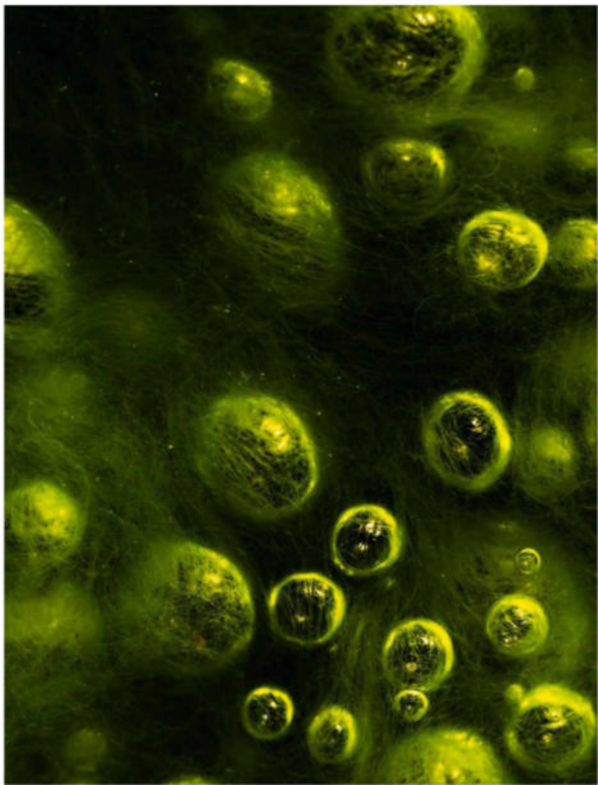
Jon A Juárez, Spain
Winner: Photojournalism

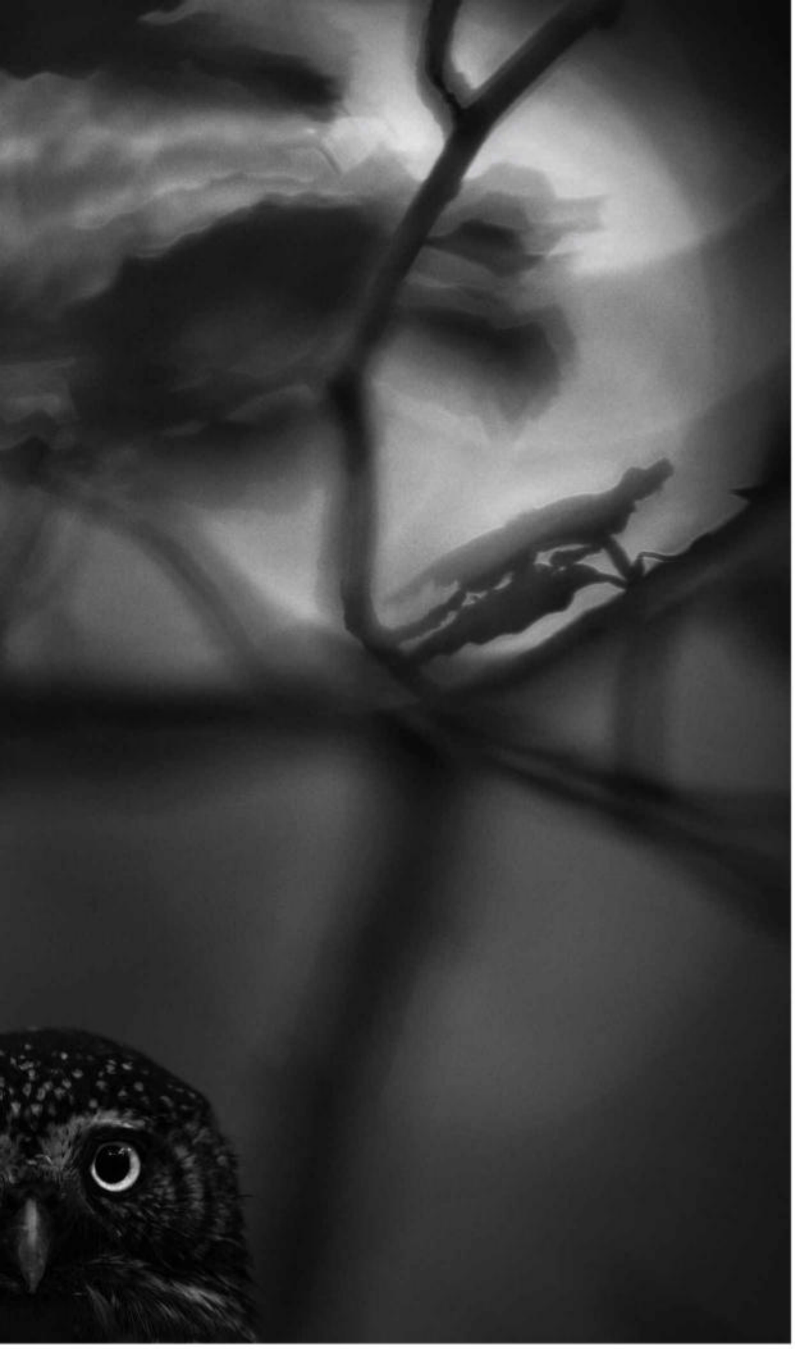
Jon has spent years documenting the work of the BioRescue Project, and says that witnessing a milestone in saving a species "was something I will never forget". This southern white rhino foetus, which did not survive due to an infection, was the result of the first successful rhino embryo transfer into a surrogate mother through IVF. This breakthrough paves the way for saving the rare northern white rhino from extinction, as scientists can take the next crucial steps towards transferring the first northern white rhino embryo into a southern white rhino surrogate. Jon took the photo at Ol Pejeta, Kenya.

Vanishing pond

Sebastian Frölich, Germany
Winner: Wetlands, The Bigger Picture

Sebastian visited the fragile wetland ecosystem of the Platzertal moorlands, Austria, to highlight its importance as a carbon sink and a diverse wildlife habitat. A tiny springtail ran across gas bubbles rising through the algae, giving this image a sense of scale. Austria has lost 90 per cent of its peatbogs, and only 10 per cent of those that remain are in good condition. Platzertal is one of the last intact high moorlands in the Austrian Alps, renowned for its carbon-storing peatbogs.

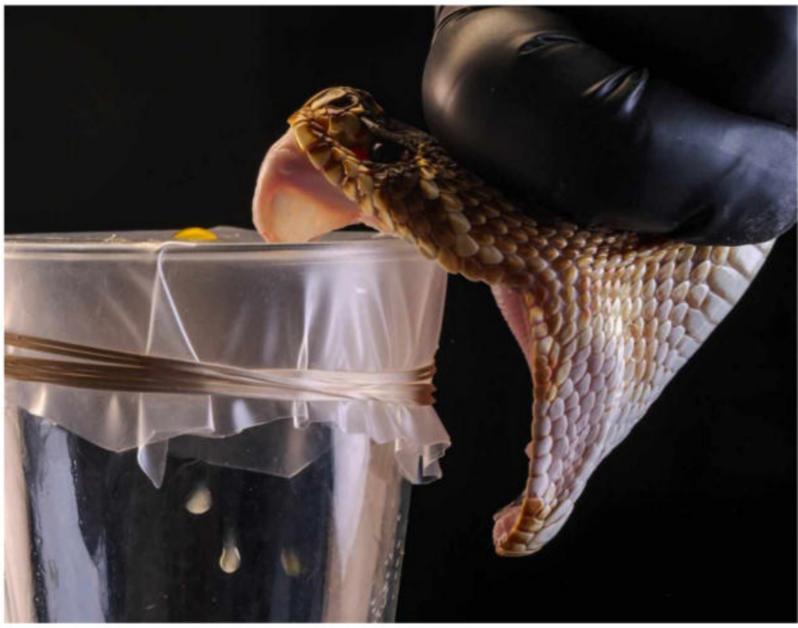


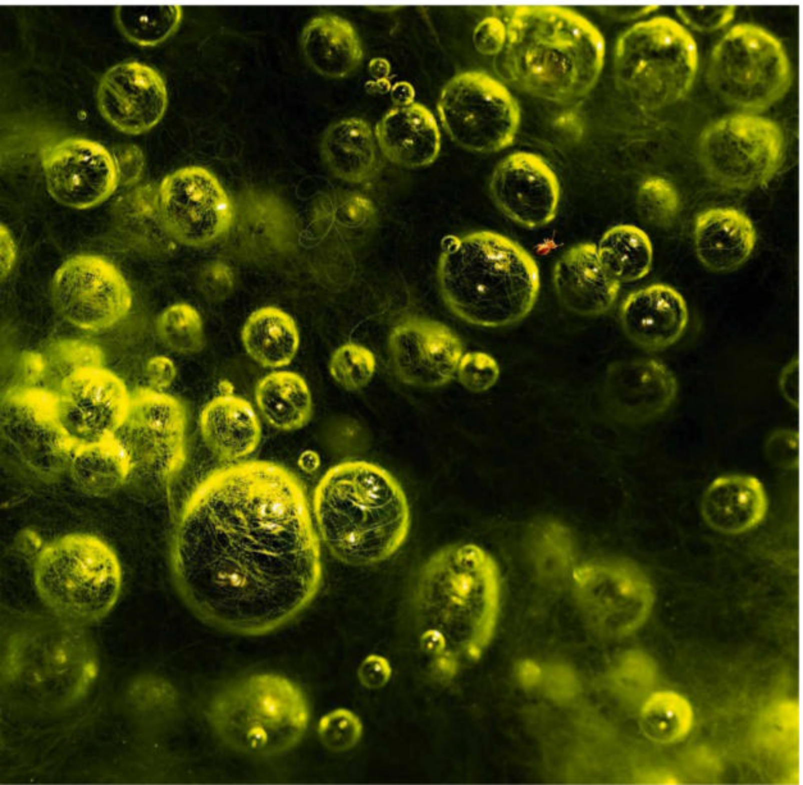


Watchful moments

Luca Lorenz, Germany
Winner: Rising Star Award

The Rising Star Award is a portfolio of 6–10 images that demonstrate style and artistry. Winner Luca's childhood ambition was to learn everything he could about birds, and he spent long hours in the parks around his home on the outskirts of Berlin. His portfolio includes this shot of a secretive Eurasian pygmy owl – the unusual black-and-white composition makes the most of the background silhouettes, which Luca felt suited a bird that lives among the shadows.



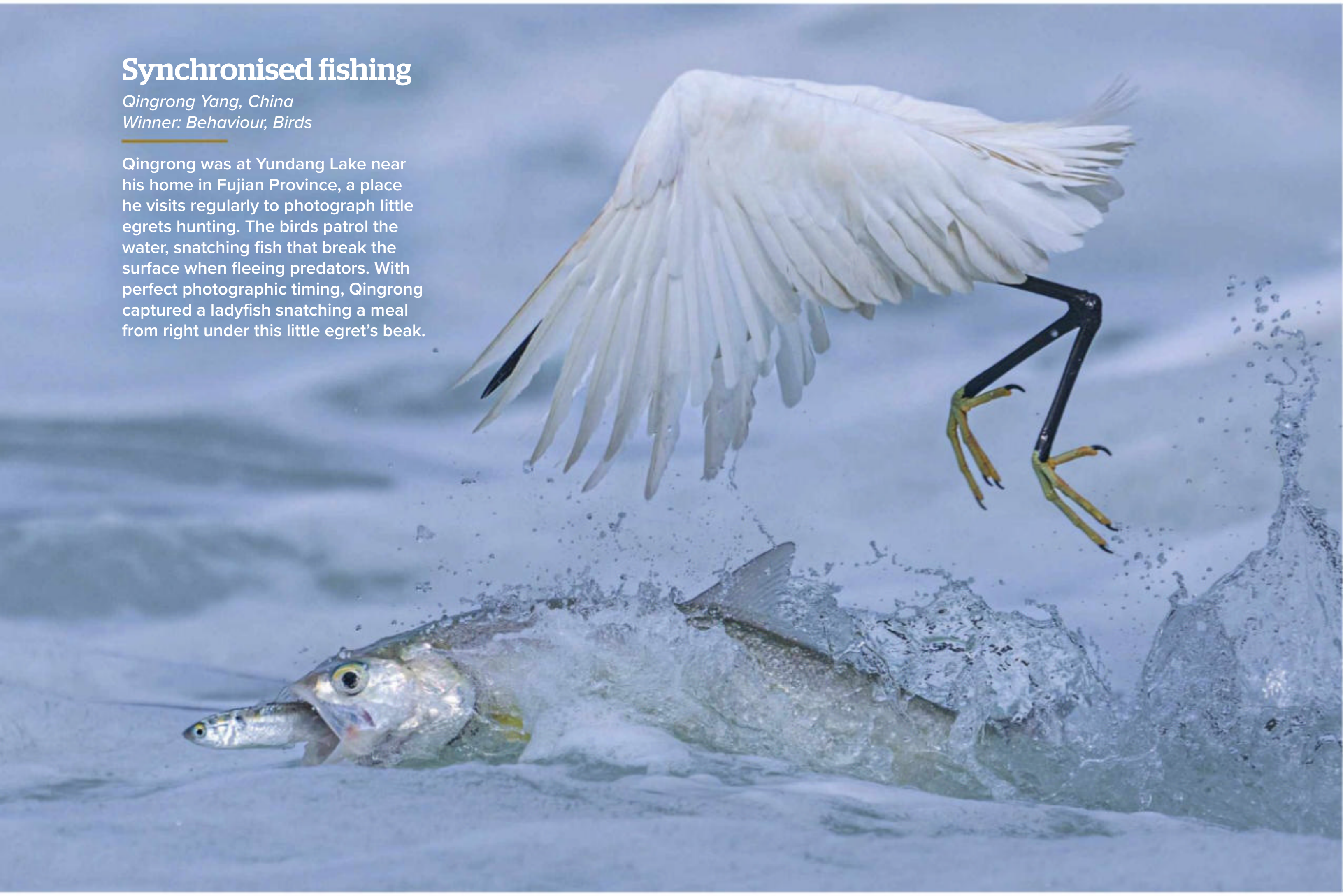


End of the round-up

Javier Aznar González de Rueda, Spain
Winner: Photojournalist Story Award

For centuries, rattlesnakes have been viewed in different ways across the American continent – from reverence and respect to fear and suspicion. Annual rattlesnake round-ups in the USA, where hunters compete to collect the highest weight of snakes, began in the 1930s. Today, these competitions are losing their appeal, but in some states anti-rattlesnake sentiment remains strong. In this portfolio, Javier calls for respect and protection for these creatures before they disappear from the American landscape.

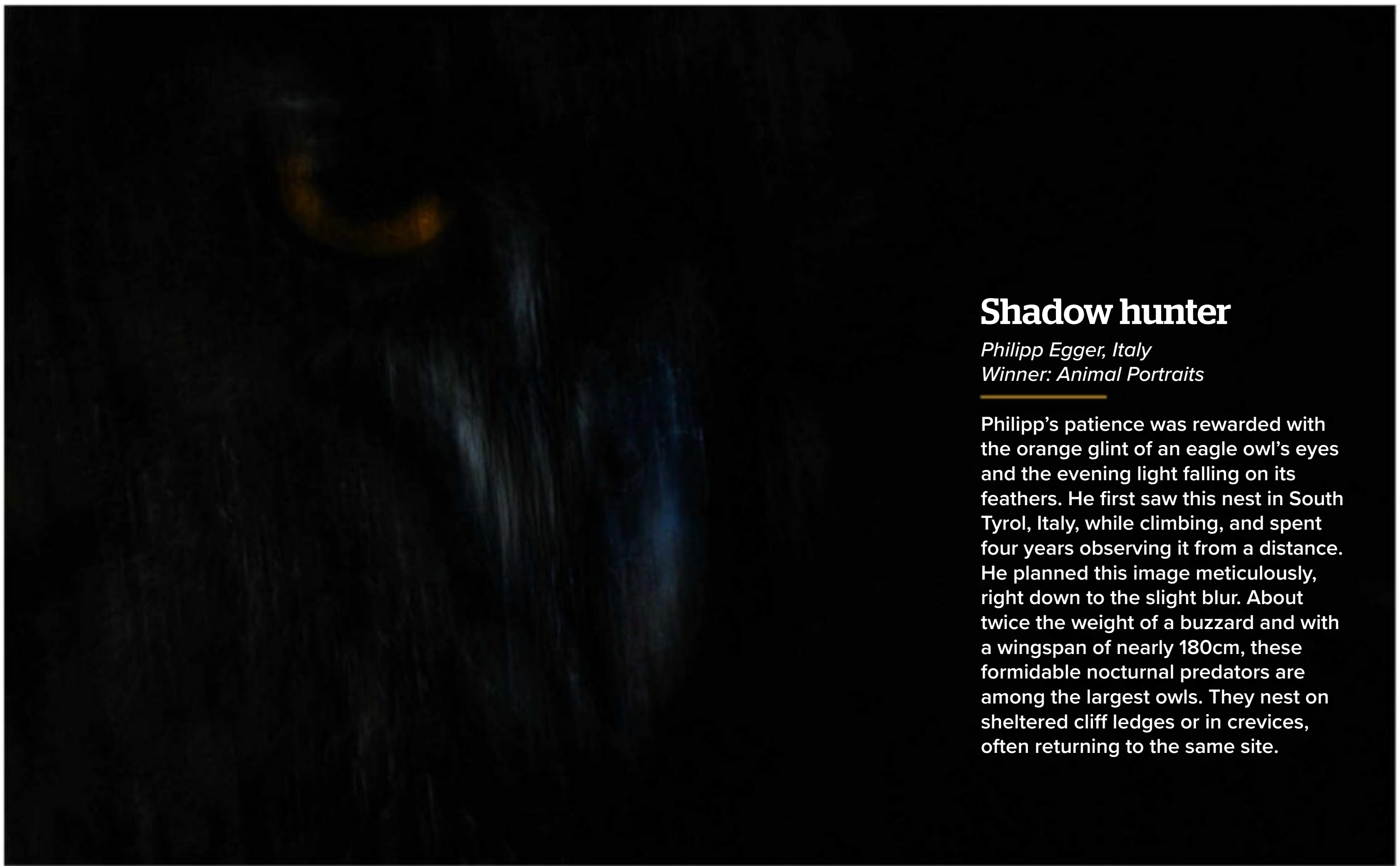
This image – one of a set of six – highlights another side to the story: the role of snakes to human health. Drops of deadly venom drip into a glass as an eastern diamondback rattlesnake is milked. The venom is used to produce antivenom and can be used to treat medical conditions.



Synchronised fishing

Qingrong Yang, China
Winner: Behaviour, Birds

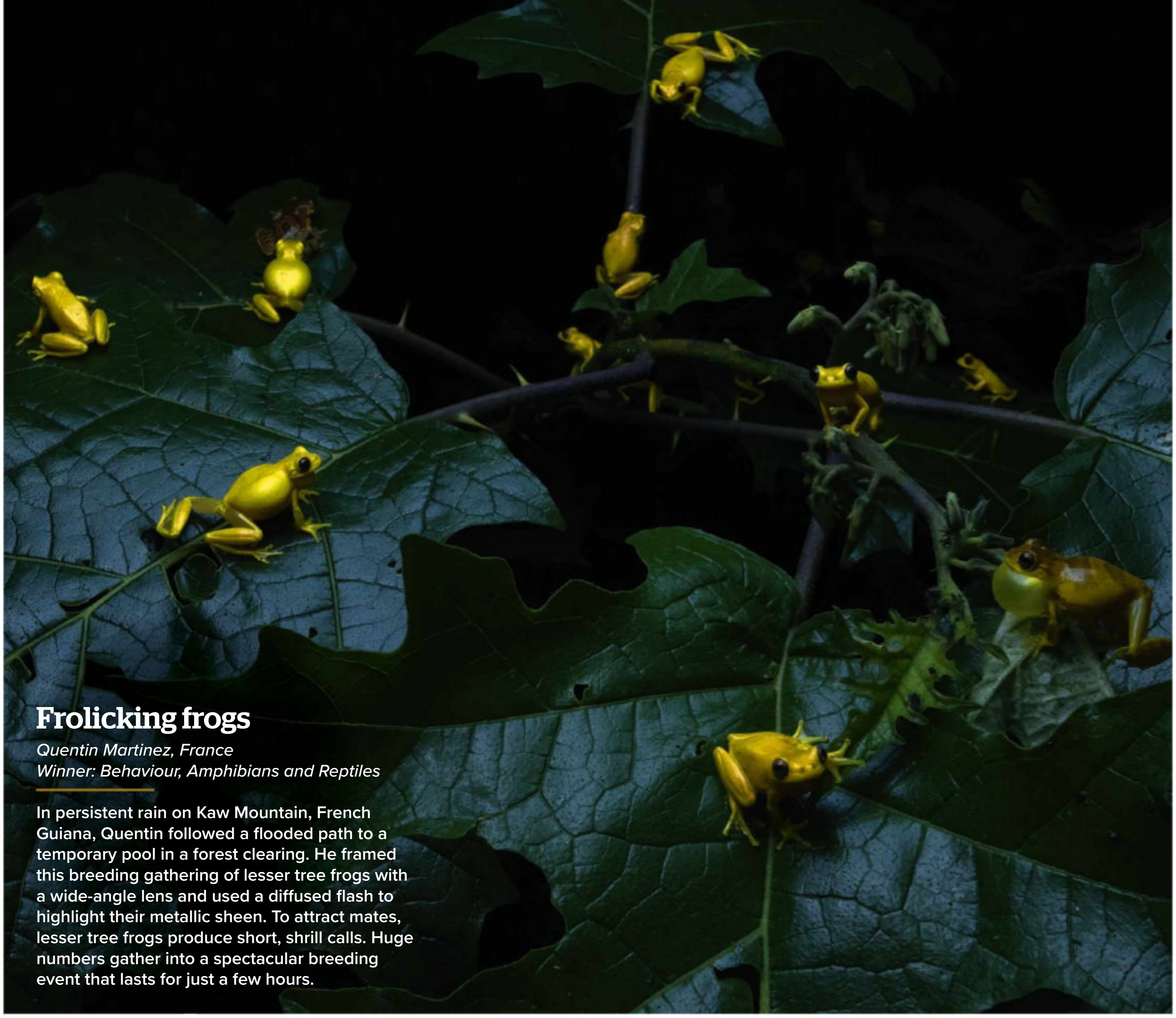
Qingrong was at Yundang Lake near his home in Fujian Province, a place he visits regularly to photograph little egrets hunting. The birds patrol the water, snatching fish that break the surface when fleeing predators. With perfect photographic timing, Qingrong captured a ladyfish snatching a meal from right under this little egret's beak.



Shadow hunter

Philipp Egger, Italy
Winner: Animal Portraits

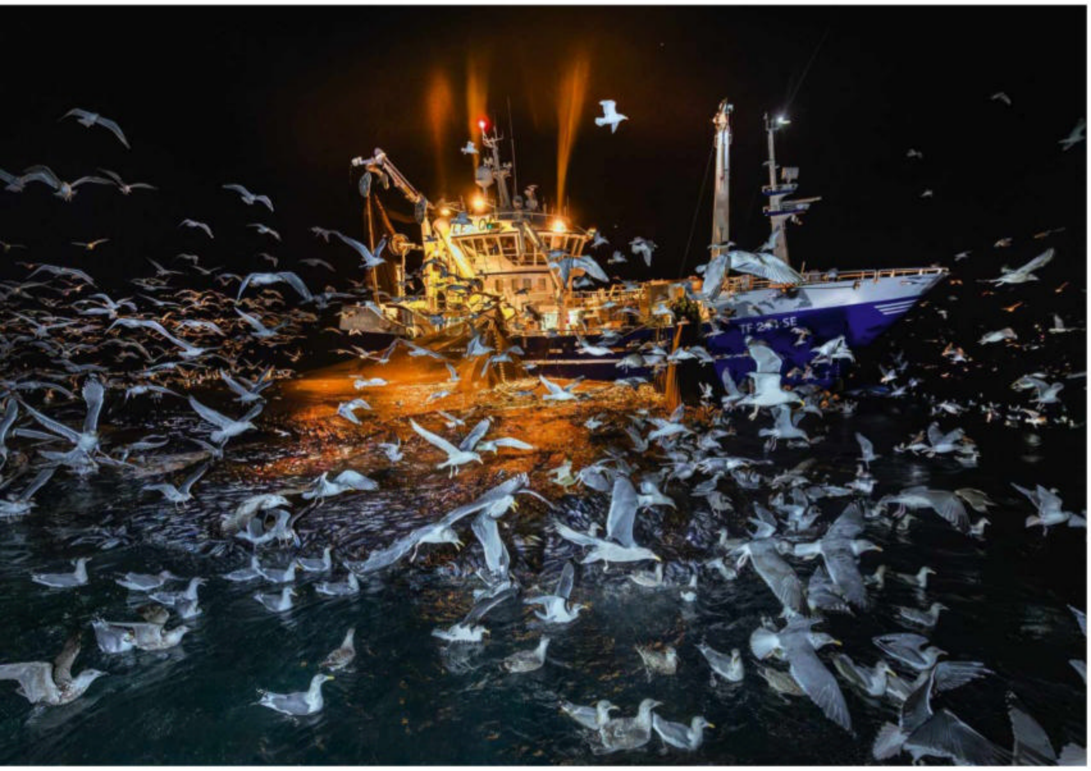
Philipp's patience was rewarded with the orange glint of an eagle owl's eyes and the evening light falling on its feathers. He first saw this nest in South Tyrol, Italy, while climbing, and spent four years observing it from a distance. He planned this image meticulously, right down to the slight blur. About twice the weight of a buzzard and with a wingspan of nearly 180cm, these formidable nocturnal predators are among the largest owls. They nest on sheltered cliff ledges or in crevices, often returning to the same site.



Frolicking frogs

Quentin Martinez, France
Winner: Behaviour, Amphibians and Reptiles

In persistent rain on Kaw Mountain, French Guiana, Quentin followed a flooded path to a temporary pool in a forest clearing. He framed this breeding gathering of lesser tree frogs with a wide-angle lens and used a diffused flash to highlight their metallic sheen. To attract mates, lesser tree frogs produce short, shrill calls. Huge numbers gather into a spectacular breeding event that lasts for just a few hours.



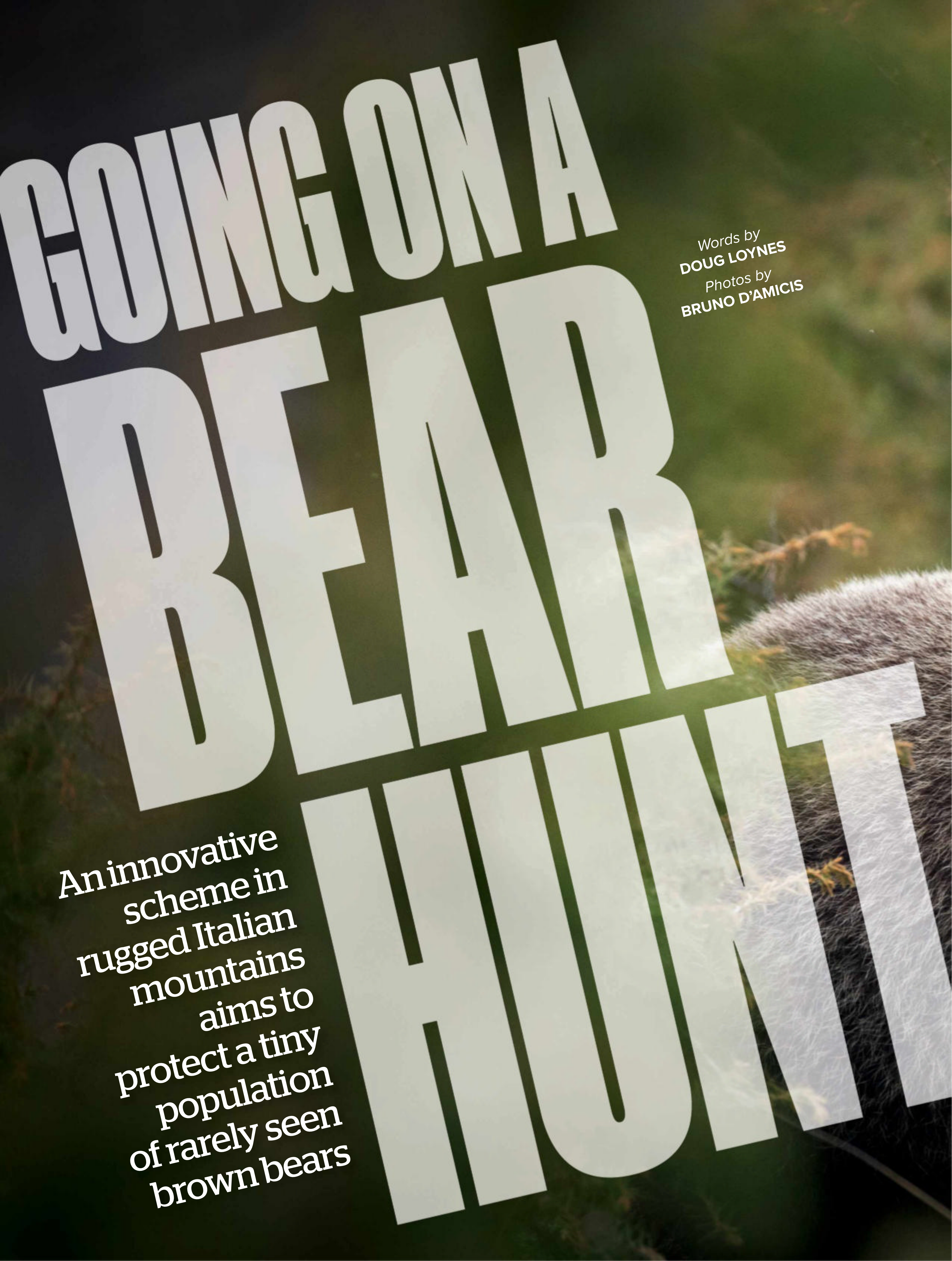
The feast

Audun Rikardsen, Norway
Winner: Oceans, The Bigger Picture

Out in Kvænangen Fjord, Skjervøy, Norway, Audun managed to photograph this chaotic scene of gulls attempting to catch fish trapped in purse-seine nets. The gulls have learned to follow the sound of the boats to find a herring feast. Many birds drown in or around these nets each year, yet various fisheries and researchers are trialling solutions, including sinking the nets more quickly to make them less accessible.

VISIT THE EXHIBITION

The exhibition of the 100 award-winning images runs at the Natural History Museum, London, until 12th July 2026. Adult tickets start at £15.50. For more details, visit nhm.ac.uk.

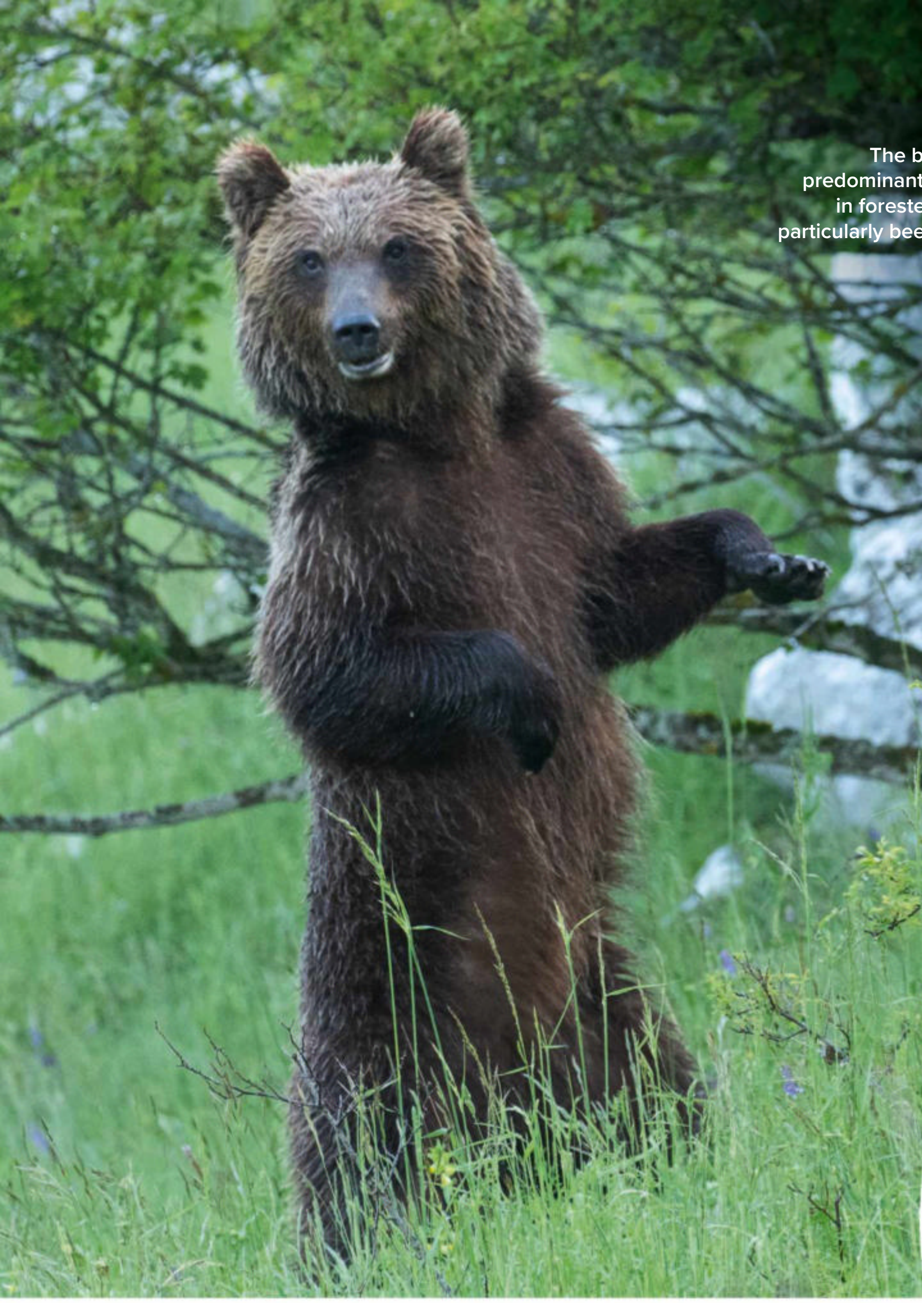


GOING ON A BEAR HUNT

Words by
DOUG LOYNES
Photos by
BRUNO D'AMICIS

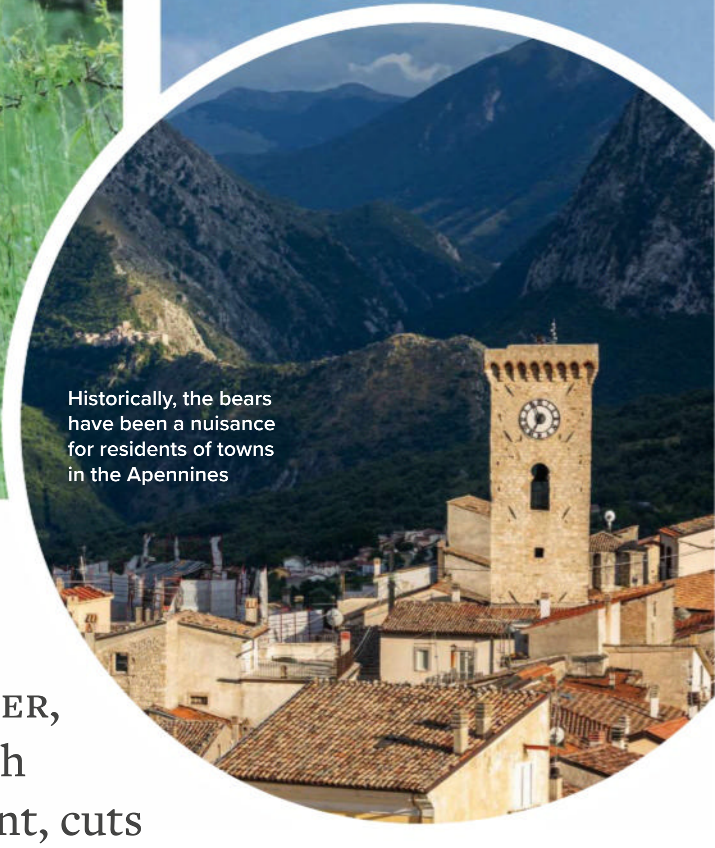
An innovative scheme in rugged Italian mountains aims to protect a tiny population of rarely seen brown bears

A tiny population of Marsican brown bears inhabits a range that covers about 5,000-8,000km²



The bears are predominantly found in forested areas, particularly beechwood

The Marsican brown bear has become a local symbol and lent its name to traditional regional foods



Historically, the bears have been a nuisance for residents of towns in the Apennines

THE WHISPER, sharp with excitement, cuts through the silence: “It’s a bear.” One of our group is pointing to a hillside in the distance, where beech trees tumble down into a valley veiled in drizzle. There’s a hushed flurry of movement as the rest of us scramble for binoculars to bring the blur of brown into focus.

“The Central Apennines are home to the world’s only population of Marsican brown bears”

I find the figure in the lens. Brown fur. Four legs. Antlers. “It’s a stag”, says Filippo Castellucci, our nature guide, with the same easy smile he’s worn since we arrived in Italy’s Central Apennines. He’d known it wasn’t a bear we’d spotted. But here among the mountains where he was raised, disappointment is a stranger to Filippo. “It’s not always about finding wildlife,” he tells me. “It’s the element of unpredictability that makes these experiences so beautiful.”

As if to soften the blow of our false sighting, a brilliant rainbow pierces the darkening sky, plunging into the heart of the valley. We linger a little while longer, spellbound, as daylight slips away. The only sounds are the soft patter of rainfall and the distant clinking of bells carried by horses roaming freely across valley floor. Then the evening chill defeats us, and we turn for the warmth of our mountain cabin.

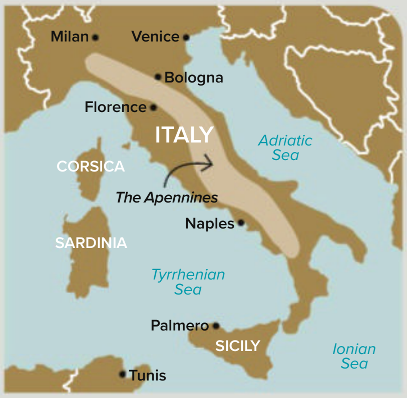
ABOUT THE AUTHOR

Doug is a travel writer focusing on stories about sustainable travel as a force for good. He went on the Italian Apennines: Walks and Wildlife tour courtesy of Exodus Travels.

THE APENNINES ARE A RUGGED chain of mountains stretching down the spine of Italy, with deep forests roamed by wolves and golden eagles that soar above frost-capped peaks. The Central Apennines are also home to the world’s only population of Marsican brown bears, a Critically Endangered species now numbering between just 60 and 90 individuals. I’m on the trail of these rare bears on a six-day walking tour with Exodus Adventure Travels, whose partnership with local NGO Rewilding Apennines offers visitors an opportunity to learn about the essential work that’s underway to keep them protected.

In conservation, rewilding is a progressive approach to restoring ecosystems

Where are the Apennines?

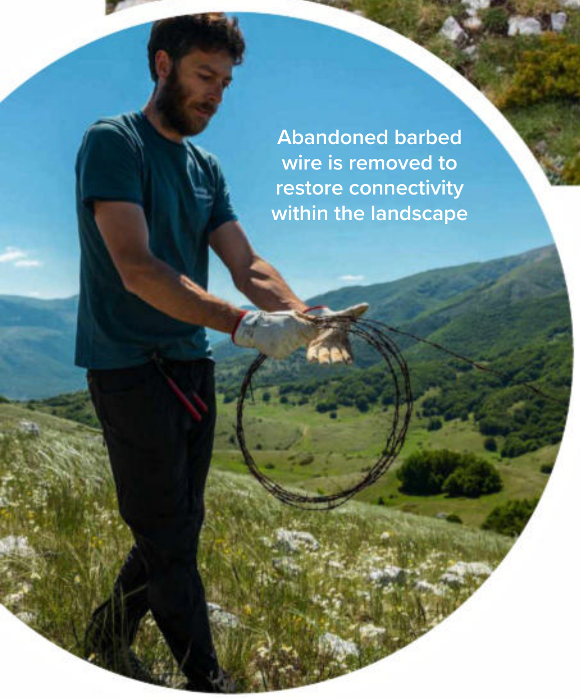


The Apennine Mountains run down the centre of Italy, forming the country’s backbone. Their total length is about 1,400km. Snowfalls are frequent, with cold winters and hot summers.

The bears live for 20-25 years in the wild – but cub mortality is about 50 per cent

Champions for chamois

The Apennine chamois, a subspecies of Pyrenean chamois, is another notable species of the Apennines. Once common across these uplands, where it roamed the highest peaks, this goat-antelope became confined to a scattering of protected areas following years of hunting and habitat loss. However, reintroductions in the late 1990s and early 2000s are now coming to fruition – in Maiella National Park, for example, a founding 40-strong population reintroduced 25 years ago has now grown to 1,300 individuals. Further reintroductions are in the pipeline.



Abandoned barbed wire is removed to restore connectivity within the landscape

> “Here in the Central Apennines, you have winemakers and shepherds living alongside wolves and bears”

by creating the conditions for self-sustaining natural processes to flourish and resume their vital work in repairing degraded landscapes. In other words, rewilding is about letting nature do its thing to get everything back on track. Sometimes this might mean reintroducing keystone species, such as apex predators who play a critical role in rebalancing food chains and restoring natural ecological balance.

But here in the mountains of central Italy, where bears and wolves have always clung to a foothold, rewilding efforts focus on improving habitat connectivity. By linking different protected areas through so-called ‘coexistence corridors’, conservationists at Rewilding Apennines are aiming to give wildlife populations the freedom to move safely across the landscape, expand their territory and, it’s hoped, boost their numbers.

The emphasis on ‘coexistence’ offers an insight into the challenges facing rewilding in this area, as Valerio Reale, enterprise manager at Rewilding Apennines, explains. “Italy is a thin strip of land where everything is entangled – people, traditions, nature. Here in the Central Apennines, you have winemakers and shepherds living alongside wolves and bears.” Valerio tells us that rewilding in Italy must be about keeping these traditions – and the country’s food and farming culture – alive in a wilder world.

Unlike countries such as Scotland, where vast estates owned by a few families have made rewilding relatively straightforward to implement through top-down agreements, Italy’s countryside is a densely woven patchwork of smallholder farms, each often just a few hectares in size, passed down through the generations. This makes consensus harder to achieve, but it also opens the door to a richer, more collaborative model of rewilding that grows from within rural communities.

Success therefore hinges on conservation groups such as Rewilding Apennines earning the trust of local farmers and convincing them that human-wildlife coexistence can support, rather than threaten, their ways of life. There has been a long history of conflict between predators and farmers in the region, but attitudes are shifting, according to Valerio.

“We have to stop fuelling this story that bears and wolves are the main challenges facing farmers today,” he says. “You’ll find that good farmers, those who truly support biodiversity, have no issues with predators. They understand their role in the ecosystem.” In fact, Valerio argues, coexistence with wildlife could enrich traditional farming, not undermine it.

We stop for lunch one afternoon in Bosco della Selva, a woodland area managed by Rewilding Apennines. As we feast on a banquet of tangy local cheeses, wild greens and homemade chutneys, Valerio points to studies that have shown how the presence

Ecotourism is one way that conservationists in the region hope to spread their message

Deep claw marks indicate there are bears in the area

of wild animals can influence the flavour of artisanal produce. He explains how Rewilding Apennines partners with local farmers, foragers and artisans to ensure they share in the benefits brought by wildlife tourism. Such collaborations bring an economic boost to rural communities, while tourists are able to enjoy tasty food produced from the land. This, says Valerio, is rewilding the Italian way.

Creating opportunities for locals is only part of what coexistence means here in the Apennines. In a landscape prowled by wild bears, it's also important that people and predators are kept apart. There are no reported cases of Marsican brown bears, typically shyer and less aggressive than their larger cousins, attacking humans. But historically they've been a nuisance for farmers and residents in the Apennines' medieval mountain towns. In one headline-grabbing case from 2021, a bear broke into a village bakery and ate all the biscuits.

WOMEN HIKING AND WOLF: FILIPPO CASTELLUCCI

As well as brown bears, the Apennines are also home to chamois, wild boars and wolves

Rewilding Apennines works with local administrations and individuals to keep bears out of towns by introducing proactive 'bear-smart' measures, such as electric fencing around livestock and bear-proof bins. Education is equally important: teaching habits such as removing fruit when it falls on the ground can make a big difference if a community pulls together. But despite the success of these bear-smart initiatives, human activity still poses dangers to the region's bears, sometimes with fatal consequences.

ON OUR FIRST DAY IN THE Apennines, we were joined by Matteo Marcelli, a local farmer working with Rewilding Apennines to adopt more sustainable grazing practices, as he guided his herd of horses through the mountains to higher summer pastures. We climbed through beech forests and across wildflower meadows bursting with yellows and violets, the fragrant whispers of wild thyme and sage drifting on the breeze.

Over lunch at Matteo's cabin on the summit, against a perfect frame of rural mountain life, we learned the tragic news that just the day before two Marsican bear cubs had drowned in a reservoir at an abandoned ski resort.

The cubs' deaths were a huge blow to the Rewilding Apennines team, whose appeals to the municipality for the reservoir to be made safe had been ignored for years. Seated on a bench outside Matteo's cabin, Valerio's eyes brimmed with tears. "You can engage the community and have all of these initiatives, but when this happens… what can you do?"

He told us of other recent tragedies, including a bear that had been shot dead after wandering on to private land in 2023. That same year, the bakery-heist bear was hit and killed by a car on a mountain road. Could these events work as catalysts for real change, one of our company asked. "There is always a reaction in the community," said Valerio. "But now there are simply too many events like these. It's an indication of how long and bumpy the road to coexistence is."

Tragedies such as these are a reminder of why the work Rewilding Apennines is doing is so urgently needed. But Valerio has hope. "Tourism will play a big part in this story," he says. "We want more trips like these, trips reorientated towards important issues. Tourism helps us reach out to a different audience, to connect with people and show them what's at stake."

Partnering with sustainability-focused tour operators is making a measurable difference on the ground too. For every

The bears are solitary, except during mating and when with cubs

> “Caught in the spell of the mountains’ stillness, we feel lucky to be standing for a while in the bear’s wild world”

guest who travels with Exodus, 100m^2 of land is rewilded in the Italian Apennines, a commitment that has seen the rewilding of more than 650ha since 2022. What’s more, all profits from Exodus’s Walks and Wildlife tour in the Italian Apennines go towards Rewilding Europe’s important work.

These contributions not only support habitat recovery and help Rewilding Europe scale up its bear-smart initiatives in the coexistence corridors, but they also make visitors participants, not just spectators, in the region’s conservation story.

BACK ON THE TRAIL ON OUR penultimate day, we’re still waiting for our first glimpse of a bear. But there are signs of its presence all around: a wooden post scored with deep claw marks, a tuft of coarse brown hair snagged on a barb. The latter is a small but important find – Filippo explains that this sample will feed into the ongoing genetic census of the Marsican brown bear. Citing the success of the coexistence corridors, Filippo is hopeful that the new data, due to be published next year, will show that the region’s bear population has grown since the last census more than 10 years ago.

“We know that one of the corridors, the one connecting the Abruzzo, Lazio and Molise National Park with the Maiella National Park, has been used by the bears to disperse,” he says. “Now there’s a stable presence of bears in the Maiella area.” He hopes that other corridors will help the Marsican bears in expanding their range and establishing themselves in more protected areas across Central Italy.

We rise before dawn the following morning. Wrapping our extra layers tightly around us, we follow Filippo from our mountain cabin to a vantage point looking across the valley. Ahead loom the peaks of the Monti Marsicani, the mountain range that gave its name to the Marsican bears that have so far eluded us. We wait in silence.

Filippo raises a hand and points across the valley. At first, we see nothing. Then, from the shadows of the forest, a lone wolf emerges. He climbs high above the treeline and pauses on a high ridge, his lithe frame cutting a sharp silhouette against the pale sky. It’s our second wolf sighting of the trip: on the first morning, we’d seen two glide through a mist-pooled meadow, hardly 30m away. Frozen in place, we watch the wolf survey his mountain home. Then he slips away behind the curve of the ridge, and the landscape is empty once more.

Another 30 minutes pass. The cold has thinned our group – some have returned to the warmth of the cabin. The rest of us know our chances of glimpsing a Marsican bear are fading fast. But something else holds us here now. Caught in the spell of the mountains’ stillness, surrounded by sweeping wilderness, we feel lucky just to be present, to be standing for a while in the bear’s wild world.

So, when Filippo smiles and gestures that it’s time to move on, we’re not disappointed. A sighting would have been an extraordinary gift. But simply spending time here in the Apennines leaves a lasting impression.

NIGHT MOVES

Noctourism reveals wildlife's secret rhythms while boosting vital conservation efforts

Words by **PAUL BLOOMFIELD**

FIREFLIES: KONRAD WOTHE/NATUREPL.COM

The spot lamp sweeps across the track as the Land Rover trundles forward, kicking up the unmistakable scent of the African bush at night. That pool of light reveals fleeting flashes of mopane and acacia trees, gently swaying grass, the sluggish ripples of the Lubi River. I peer into the inky black, thirsty for telltale twin pinpricks.

Suddenly a pair of green-yellow spots appears overhead, a glimpse of mottled fur. Genet? No – the eyes are too far apart. Cutting the engine, we sigh to a halt. The spotter angles his beam near those unblinking sparks – and there, lounging on the branch, paws dangling louchely like the supermodel she is: leopard. Her eyes remain fixed on us – not baleful, not wary, just supremely at home in the night. Eventually, I remember to breathe.

Encountering such a creature in the wild – I met that magnificent predator in Zambia's South Luangwa National Park – is electrifying enough during the day. When darkness falls, the sensation is magnified exponentially. Perhaps you've experienced a jolt as a deer, startled by your headlights, leaps off the road ahead. Or tracked the flicker of bats' gossamer wings overhead. Or staked out a badger sett, watching the pied mammal snuffle out for its nightly foraging foray. If so, you'll recognise that watching – or, often, hearing – wildlife after sundown means entering another, thrillingly

ABOUT THE AUTHOR

Paul is a writer and photographer based in the West Country. His work focuses on adventure travel, wildlife and conservation, culture and heritage.

Male fireflies put on a light show with their bioluminescent trails in a forest in Bavaria, Germany

Tourists observe Mexican free-tailed bats in Texas, USA

unfamiliar world. It's a world nature-lovers are increasingly keen to explore.

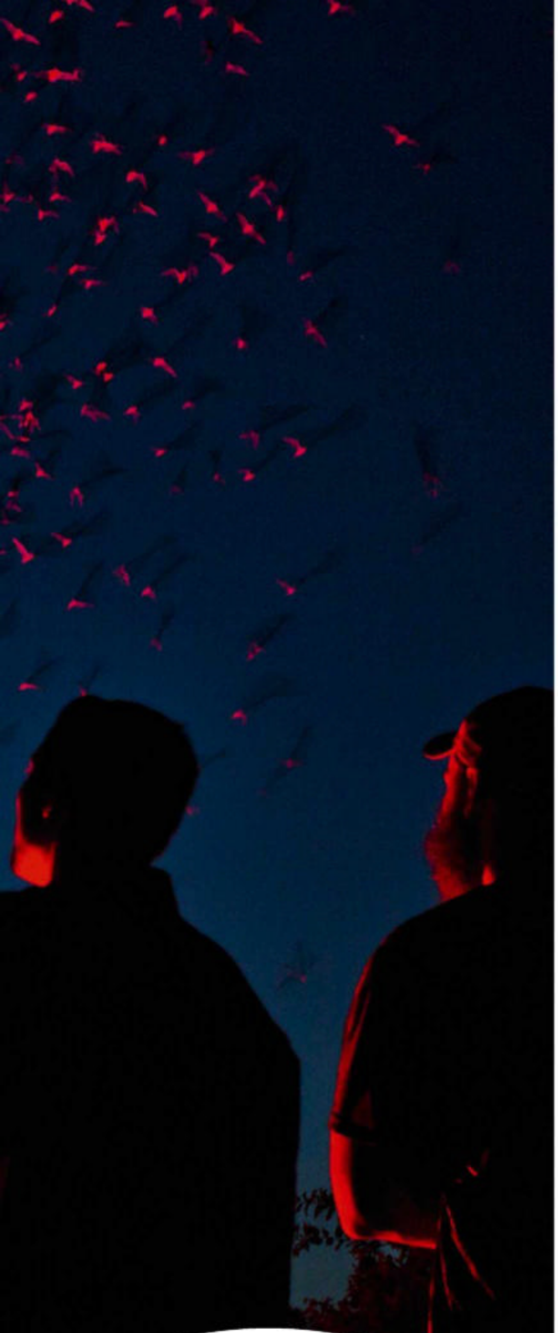
'Noctourism' is a burgeoning trend: a 2024 Booking.com survey of people from 33 countries suggested that 62 per cent considered visiting darker-sky destinations. Astrotourism – eclipse-chasing, tracking meteor showers, viewing the aurora – is booming. But while many travellers head to the 230-plus dark sky places designated by DarkSky International for stargazing experiences, others yearn to watch nocturnal and crepuscular wildlife – of which there's an astonishing diversity.

> "You're so much more focused, so you pick up on the calls of owls, rustling in the bushes, eyeshine"

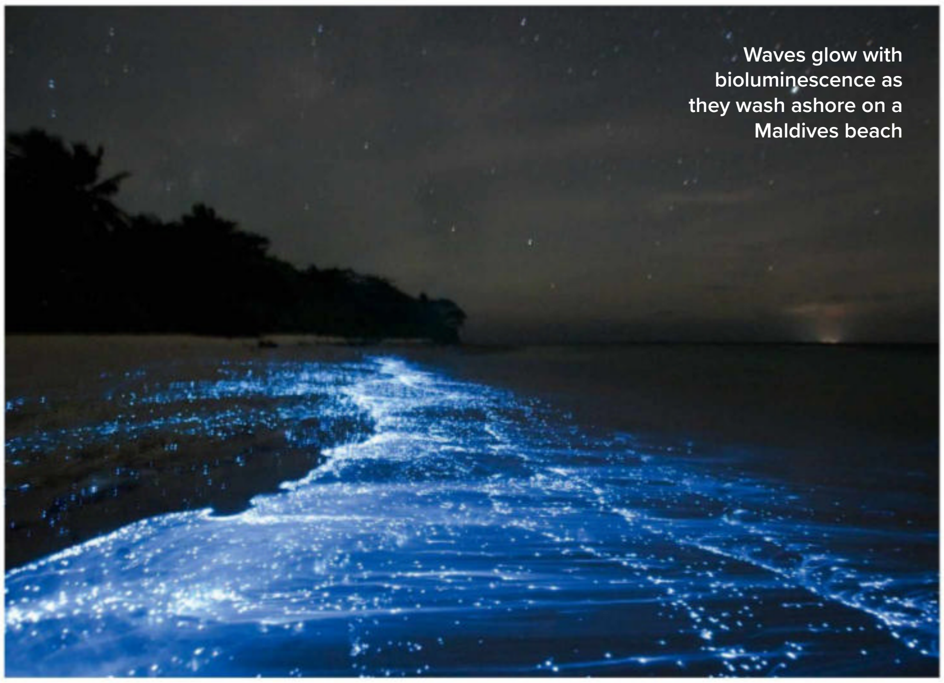
That includes around 69 per cent of all mammals. Some two-thirds of invertebrates, too, are partially or wholly nocturnal, often performing vital ecosystem functions: moths exploiting night-flowering plants are more efficient pollinators than bees. A smaller but sizeable proportion of birds are active after dark: more than 200 species of owl, of course, plus nightjars, frogmouths, potoos, night herons and New Zealand's totemic kiwis, whose bills are equipped with nostrils at the tip, plus sensory pits detecting vibrations from invertebrate prey in the soil.

MANY AMPHIBIANS AND reptiles avoid the dehydrating heat and increased predation risk of daylight. Geckos snaffle invertebrates after dusk, while frogs and toads undertake migrations to ancestral breeding ponds. Six of the seven species of sea turtle typically haul out on to beaches to dig nests and lay eggs at night, five of them in Costa Rica. The periodic *arribada* (mass arrival) of olive ridley turtles at Ostional is an extraordinary spectacle (*see Mike Dilger's Wildlife Spectacles on p28*).

The desire to witness such behaviours and little-seen species is one factor behind the boom in nocturnal wildlife watching. "In the past five years or so, the number of people wanting to get out at night to



An ogre-faced spider traps a katydid in a dark rainforest in Peru



Waves glow with bioluminescence as they wash ashore on a Maldives beach

The red-eyed tree frog of Central America hunts and courts at night

seek rare mammals has grown," reports Tom Mabbett, operations manager at Naturetrek. "For example, this year we're running seven departures of our trip to Deramakot Forest Reserve in Sabah, Malaysian Borneo, where we spend hours each night searching for elusive mammals including the Sunda clouded leopard."

It's not just about novelty, though. "Without being able to rely on your sight, your other senses are heightened," says Justin Francis of Responsible Travel. "You become more aware of your vulnerability in the landscape, and more in tune with the smells and sounds of the wilderness around you."

Ian Loyd, product manager and tour leader at Wildlife Worldwide and The Travelling Naturalist, agrees. "Nighttime wildlife watching is a hugely immersive experience. You're so much more focused, and there is less distraction, so you pick up on the calls of owls, rustling in the bushes, eyeshine. It provides a very special and exciting window into the wild world."

It's also an undeniably primal thrill.

"I joined an expert guide for wolf trekking in Italy's Apennines," recalls Megan Eaves-Egenes, author of the forthcoming book *Nightfaring: In Search of the Disappearing Darkness*. "In the pre-dawn hours we heard wolves howling. They were several miles away, but the sound just filled the valley like an ambulance siren – incredibly loud. It was a powerful reminder of why being outside after dark sparks fear, an ancient response from the days when humans weren't predators but prey."

Indeed, research has shown that humans are innately prone to more intense fear at

BATS: KARINE AIGNER/NATUREPL.COM; FROG: CARPE32/GETTY; SPIDER: EMANUELE BIGGI/NATUREPL.COM; MALDIVES: DOUG PERRINE/NATUREPL.COM

night. It seems that light suppresses activity in the amygdala – the brain's 'fear centre' – which prompts our fight or flight responses. So it's not surprising that nocturnal encounters, especially with predators, are more spine-tingling.

Unlike diurnal humans, nocturnal creatures have evolved diverse adaptations to thrive in darkness. Some have large eyes, equipped with many rods (photoreceptors detecting light, crucial for vision in dim conditions) but fewer cones detecting colours. A reflective layer called the tapetum lucidum behind the retina increases light sensitivity, and produces the eyeshine so helpful when spotlighting lions and leopards, crocodiles, owls and spiders on a night safari.

Bats, of course, use sonar to hunt and navigate in darkness. Pit vipers and other snake species have sensors detecting infra-red radiation, a little like thermal imaging. Raccoons have extremely sensitive and dexterous 'fingers', digits used to explore and identify food objects at night. Spiders sense vibrations of potential prey caught in webs.

OTHER ADAPTATIONS ARE MORE photogenic. A number of nocturnal insects, as well as fish, crustaceans, molluscs and jellyfish living in gloomy ocean depths, create bioluminescence by synthesising or absorbing luciferins – molecules that react with oxygen to produce light. The results can be magical: fireflies flashing across a meadow to attract mates, for example. In Waitomo Caves, New Zealand, 'black-water rafting' sees visitors floating beneath constellations of glow-worms – actually the larvae of fungus gnats luring invertebrate prey. Then there's the ethereal light show produced by tiny dinoflagellates in a few enchanted spots – perhaps most famously Mosquito Bay on Vieques, Puerto Rico, cited as the brightest bioluminescent bay in *Guinness World Records*. It's best experienced aboard a kayak, leaving a wake of incandescent ripples.

Aquatic nocturnal experiences are among the most memorable. Snorkellers and scuba divers meet a new cast of submarine characters at night, when many species venture out to feed and breed.

Various sharks – night, zebra, whitetip reef – are typically nocturnal: the heart-in-mouth lurch as a razor-toothed torpedo flashes though your torch beam is indescribable. Dive Australia's Great Barrier Reef on the right night and you might also find yourself enveloped by a blizzard of coral eggs and sperm, produced in mass spawning events after a full moon, usually in the austral spring (October to December).

On land, activities may be determined by the presence or absence of large predators.

LIONS AT WATERHOLE IN KENYA: WILL BURRARD-LUCAS/NATUREPL.COM

Lions mostly hunt at night as their eyes have adapted to the dark, giving them an advantage over their prey

Raccoons have great night vision and sense of touch for activities in the dark

“Thermal-imaging cameras and scopes can be game-changing for finding small animals in open landscapes”

In East and Southern Africa, night drives are the norm, showcasing lions and leopards as well as genets, civets, caracals, porcupines and honey badgers, and occasionally yielding coveted sightings of pangolins, aardvarks or aardwolves.

Across the Atlantic in Brazil’s Pantanal, the world’s largest tropical wetland region, vehicle safaris seek out jaguars, ocelots, giant anteaters, tamanduas and armadillos.

Annual coral spawning – seen here at Abaco in the Bahamas – only takes place at night

Walking safaris augment night drives in destinations such as Sri Lanka, where the focus is typically on observing unique behaviours of smaller cats. “On a recent visit, we found a big male fishing cat that started hunting as we watched, using a red-filtered light to avoid disturbing him,” recalls Ian. “He slunk down to the edge of a small water body, and began tapping gently on the surface – mimicking an insect in order to attract fish, which he plucked out and ate.”

Night walks in Costa Rica’s cloud forest, where around four-fifths of animal inhabitants are nocturnal, might yield sightings of kinkajous – the arboreal ‘honey bears’ that use their long, slender tongues to lick nectar from flowers – sloths and toucans, as well as snakes, insects and spiders.

Madagascar is another destination with a substantial proportion of night-active species, including the world’s smallest primate, Madame Berthe’s mouse lemur; the Malagasy giant jumping rat – another Critically Endangered creature; and the eerie, bat-eared aye-aye, a large lemur that uses its skeletal middle finger to extract larvae from wood.

It’s possible to watch nocturnal wildlife without moving at all. Hides in Sweden and Finland are equipped for overnight observation of brown bears, with wolf or wolverine occasional bonus sightings. And a number of high-end African camps offer ‘star beds’, with only a mosquito net between you and the Milky Way. (Fear not: they’re set on platforms safe from predators, often overlooking water holes for watching animals coming to drink.)

Technological advances are improving prospects of spotting camouflaged and coy animals. “Thermal-imaging cameras and scopes can be game-changing, particularly for finding small animals in open landscapes – African grasslands, open woodland, wetlands, steppe and mountain habitats,” enthuses Ian. “It might be a nightjar roosting on the ground, or a small cat stalking a wetland that you could easily miss scanning the landscape with a torch: they’re so cryptic and, if they’re not moving, you won’t pick up eyeshine.”

This kind of tourism can benefit conservation, addressing the fact that

RACCOON: SEAN CRANE/MINDEN/NATUREPL.COM; CORAL: SHANE GROSS/NATUREPL.COM; NORTHERN LIGHTS: GUY EDWARDES/NATUREPL.COM

The concept of noctourism was popularised by people travelling to see the Northern Lights

The Ambarijeby mouse lemur is among the 92 per cent of Madagascar's mammals that are endemic

The tail of the Madagascan moon moth can reach up to 15cm

Top 10 wildlife noctourism destinations

Tasmania, Australia

Head to Narawntapu, Tasmania's 'Serengeti', to watch grazing Forester kangaroos, Bennett's wallabies and pademelons; Bonorong Wildlife Sanctuary or Devils@ Cradle for quolls and Tasmanian devils; and Bicheno to see little penguins come ashore.

Zambia

Take late-evening drives in South Luangwa and Lower Zambezi national parks to spot leopards and lions, servals and civets, grazing hippos, bushbabies, and four-toed elephant shrews.

Poland

Nocturnal tours here use thermal imaging to find bears, wolves, bisons, wild cats and Eurasian lynxes in and around Bieszczady National Park in south-east Poland.

Sri Lanka

Night visits around national parks such as Udawalawe, Wilpattu, Yala and Lunugamvehera can yield sightings of slender loris, pangolins, leopards, jungle cats, rusty-spotted cats and fishing cats, civets and spot-bellied eagle owls.

Costa Rica

Costa Rica is home to nearly 5 per cent of the planet's biodiversity, so its nocturnal wildlife is rife. Visit Monteverde Cloud Forest for kinkajous, tree frogs and vipers, and Tortuguero National Park for nesting turtles.

Finland

Hides in the north-eastern region offer overnight opportunities for close sightings of brown bears, plus occasional wolves and even wolverines.

Madagascar

A good proportion of the Red Island's endemic wildlife is nocturnal. Look for mouse and sportive lemurs, comet moths, tree frogs, leaf-tailed geckos, tenrecs and the unusual-looking aye-aye.

Sabah, Malaysian Borneo

Across Deramakot Forest Reserve, Kinabatangan Wildlife Sanctuary and Danum Valley Conservation Area, spot Sunda clouded leopards, flying squirrels, slow loris, tarsiers, colugos and binturongs.

Scotland

Heated hides are the settings for evening sessions to watch badgers and pine martens at close range. You might also see tawny owls, woodcocks, red squirrels, and red and roe deer.

Pantanal, Brazil

Watch for eyeshine from caimans on night drives in the tropical wetland, when you could also enjoy sightings of ocelots, jaguars, armadillos, coatis and southern tamanduas – a kind of tree-climbing anteater.

nocturnal animals are, by their nature, typically less evident, so they – and their habitats – may receive less protection.

"A lot of these species don't attract as much conservation funding and awareness," says Ian. "Noctourism can help. For example, South Africa's Karoo is a great destination for elusive insectivorous species such as the aardwolf and aardvark. It's largely used for sheep farming and, until quite recently, even smaller predators such as caracals were persecuted. The rise in ecotourism, particularly targeting these nocturnal species, has led some farmers to recognise the value of protecting these animals. Caracal numbers are reportedly increasing, and more land is being given over to nature."

There's a balance to be struck, of course. "Tourism can be hugely beneficial, funding rangers, research and ongoing conservation work," notes Justin. "But it will also have impacts on wildlife, particularly disturbance – arguably more so at night when many animals are hunting, seeking water and, in

MOUSE LEMUR: NICK GARBUTT/NATUREPL.COM; MOTH: WOLFGANG KAEHLER/ALAMY; SHARKS: HENLEY SPIERS/NATUREPL.COM; OWL: ARTUR TABOR/NATUREPL.COM

Grey reef sharks hunting at night in the Pacific around French Polynesia

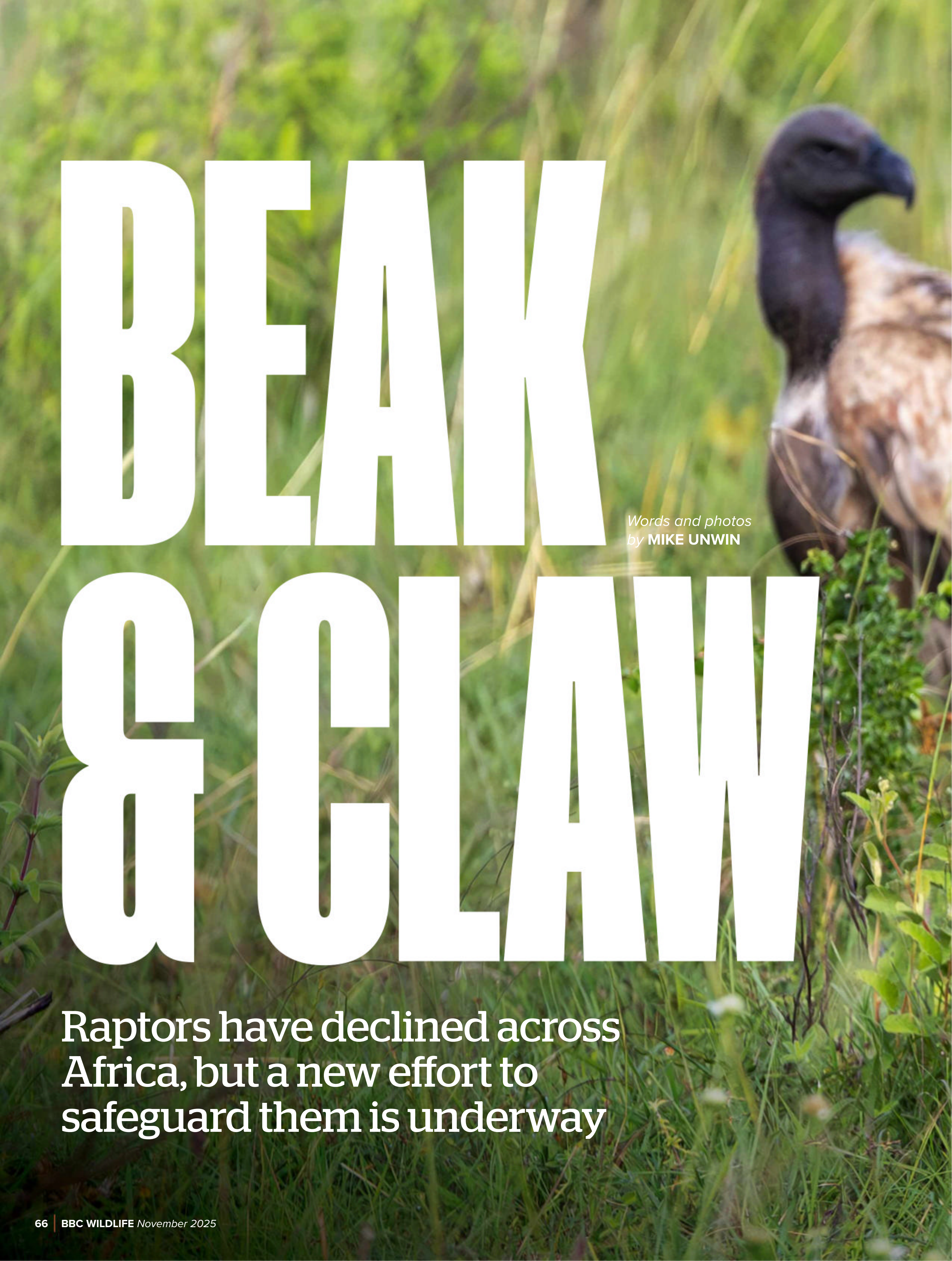
The bright-eyed Tengmalm's owl hunts for small mammals in forests in the dark

"Many of us, especially women, are taught to fear being outside at night. We need to learn to enjoy it"

busier reserves, enjoying quiet after daytime safari trucks have dispersed. Choosing a responsible safari with a local guide who understands wildlife behaviour intimately is essential to minimise disturbance and maximise the conservation benefits."

Also, consider your individual actions. Don't shine bright lights directly at an animal with sensitive night vision – you could temporarily blind it, reducing its ability to hunt or evade predation. Point the beam a little to one side. Using red or orange-yellow filters reduces negative impacts. And turn off your camera's flash, instead increasing the ISO. Train yourself to develop awareness and confidence in this unfamiliar environment.

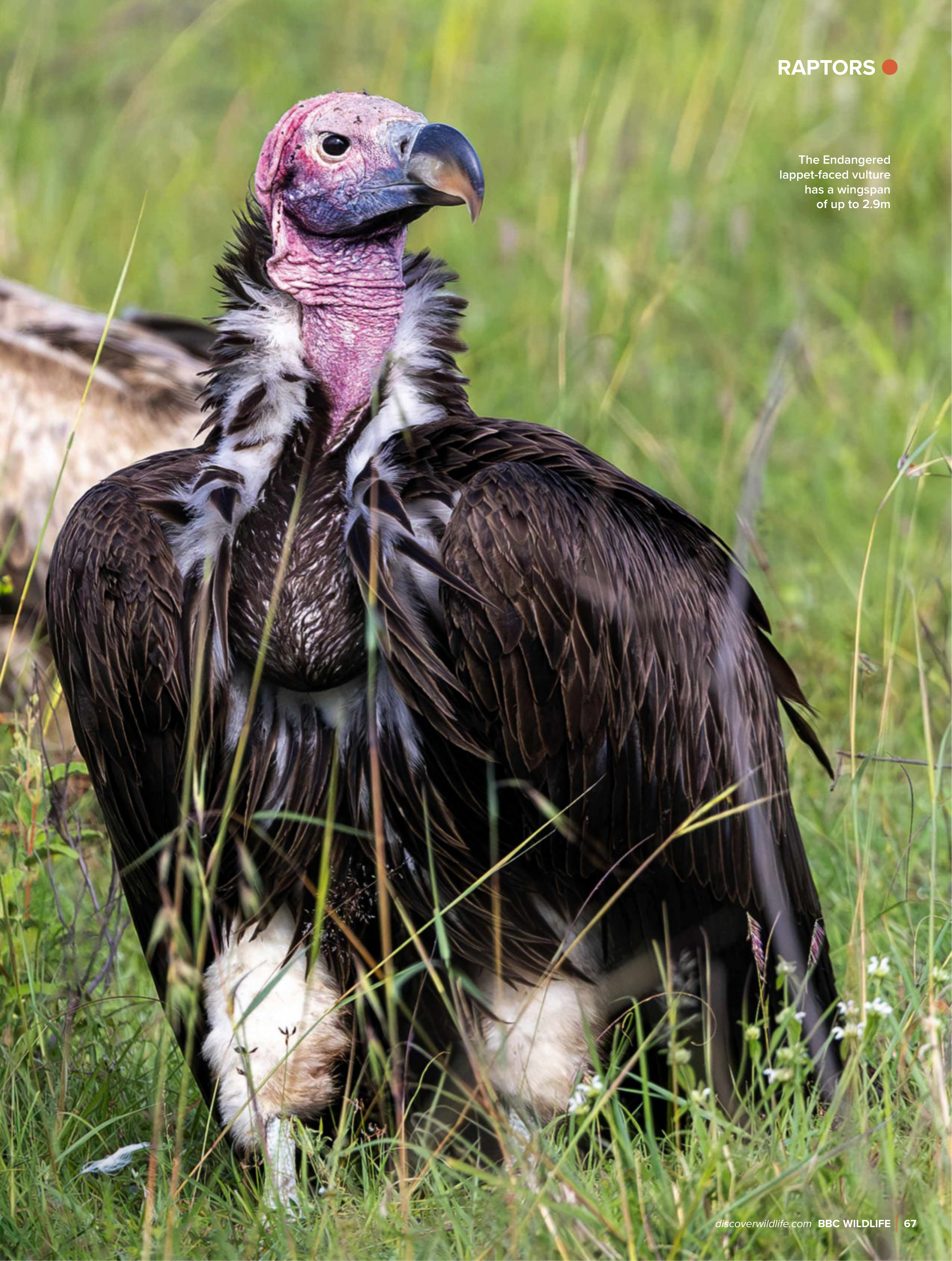
"Many of us, especially women, are taught to fear being outside at night," says Megan. "We need to learn to enjoy it. Thanks to smartphones, we're even more vision-focused than ever. So take some deep breaths, relax, be quiet. Allow about 20 minutes in darkness for your eyes to adjust, and focus on your other senses: listen, smell, discover things that you wouldn't otherwise notice. It's relearning to use those senses that reward us with unique wildlife experiences."



BEAK & CLAW

Words and photos by **MIKE UNWIN**

Raptors have declined across Africa, but a new effort to safeguard them is underway



The Endangered lappet-faced vulture has a wingspan of up to 2.9m

The white-backed vulture was once common across Africa but it's now in alarming decline

"I KNOW SHE'S THERE," SAYS Dennis. We're standing on a grassy ridge above a tree-lined watercourse, squinting through binoculars at a tangle of sticks in the canopy of a tall *Podocarpus*. "Last time, I waited two hours. But she always shows her head."

The red-faced bateleur eagle is easy to identify, so can be closely monitored

The population of the long-crested eagle with its distinctive mohawk has dropped drastically

BATELEUR EAGLE: ERIC BACCEGA/NATUREPL.COM

> "Numbers of the long-crested eagle and secretary bird, to name just two, are both down by 94 per cent"

Dennis Kapelian is one of a four-strong team working for the Mara Raptor Project. He's led me to this remote spot in Kenya's Maasai Mara National Reserve to view the nest of a bateleur eagle.

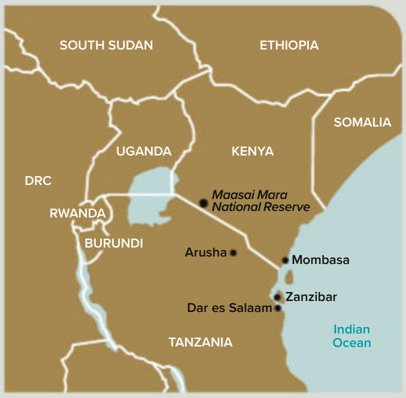
Actually, it's the old nest of a *martial* eagle, now reappropriated by a pair of bateleurs. The depth of the bowl constructed by its original, larger owners explains why the new occupants are often hidden from view.

The Mara Raptor Project is an initiative of the Kenya Bird of Prey Trust (KBoPT), which is working to reverse the fortunes of the country's large raptors, currently in population freefall. The stats are grim: 89 per cent of species have declined by at least 75 per cent over the past 40 years. And while vultures have received some publicity, other species have slipped under the radar. The long-crested eagle and secretary bird, to name just two, are both down by a catastrophic 94 per cent. Both were once abundant. Now, you're pushed to find them outside a conservation area – even here in the Mara, they're struggling. Dennis has been keeping tabs on this bateleur pair using a camera mounted on an extendable pole. I ask whether we might walk down for a peek. He gestures at the sea of grass between us and the tree, where a large buffalo has raised its gnarly head. "Safety first," says Dennis. "I don't trust that guy."

The sky boils with rainy season thunderheads. It's mid-May, which means low season for tourists but peak season for

ABOUT THE AUTHOR

Mike has written more than 35 books, including *Around the World in 80 Birds* and *Finding Home: Amazing Places Animals Live*.



Where is the Maasai Mara?

The Maasai Mara National Reserve lies in the south-west of Kenya on the border with Tanzania. It's named after the Maasai people and covers 1,500km².

Lappet-faced vultures typically site their nest in the crown of an isolated acacia

Raptor stats

153
Number of raptor species in Africa (including owls)

63%
Proportion of Africa's vulture species threatened with extinction, according to the IUCN (7 of 11 species)

2.9m
Maximum wingspan of the lappet-faced vulture, Africa's largest raptor

500
The number of days of the breeding cycle of a crowned eagle, the longest of any African raptor

250km^2
Typical home range of a pair of martial eagles, Africa's largest eagle

1,500
Number of patients treated by Kenya Bird of Prey Trust over 20 years

537
Number of vultures killed at a single poisoned elephant carcass in Botswana in 2019

> "The Mara is one of the most raptor-rich areas of the world but the birds' decline is going almost unnoticed"

nesting raptors – and this is our third nest this morning. The first belonged to a long-crested eagle, the sitting female's signature plumes fluttering in the heat haze. The next was a lappet-faced vulture's, stuffed like a haystack into the crown of an acacia on an otherwise treeless expanse, the huge bird barely visible. So far, so good, it seems. But this isn't the full picture. Basing myself at Olderkesi, a private 2,800ha conservancy adjoining the Mara's south-east corner, I have one week to fill in the gaps.

"Don't worry, we'll find plenty of raptors," says Doug Nagi, head guide at Cottar's Safaris. The team at Cottar's, which leases Olderkesi from the community and runs the only camp in the area, has partnered with the KBoPT in a new initiative to channel tourism revenue into raptor conservation. Doug points out a hill behind the camp, where a pair of crowned eagles often perform their aerial display. "Look out at lunchtime," he advises. I get the feeling that our mission makes a welcome change from the usual request for the Big Five.

STRATTON HATFIELD, MANAGER of conservation science for the KBoPT, confirms as much. "We're so obsessed with elephants and lions that we lose sight of these equally important species," he says. Hatfield came to the Mara to complete a PhD on the martial eagle, but soon found himself embroiled in the raptor crisis.

He explains how the Mara is one of the most raptor-rich areas of the world, home to around 60 species, but the birds' decline is going almost unnoticed. "Our goal is to have six people in the Greater Mara (the reserve plus surrounding conservancies) full-time," he says. "Monitoring raptors, working with communities, responding to poisonings and generally being raptor ambassadors."

The demise of Kenya's raptors has multiple causes. Conflict with the local community plays a part: vultures fall indirect victim to poisoned carcasses set for predators such as lions, which sometimes take cattle, while large eagles such as the crowned and martial are directly targeted for taking sheep and goats. Behind this lie broader environmental threats. The division of once-communal ranching land into private, fenced plots is accelerating habitat loss, reducing both prey numbers and nest sites, while an ever-expanding network of unprotected powerlines has seen countless raptors killed through collisions and electrocutions. In the Mara, hard data is a priority. "These IUCN statuses are just

If herders poison a carcass to kill predators, it can prove devastating to vultures

Caring for a Rüppell's griffon vulture at the Naivasha Raptor Centre

guesstimates: they've used relatively poor data and analysis techniques to draw relatively poor conclusions," says Stratton. He explains how keeping land managers informed is essential. "If a conservancy can say it's got 40 pairs of Critically Endangered white-backed vultures, that's a strong fundraising mechanism."

Meanwhile, his team advises on best practice: a tourist 'bush breakfast' under a prime nest tree can deter a potential breeding pair.

As for raptor ambassadors, the KBoPT project boasts a significant asset in its manager Lemein Par, who hails from the Maasai community and is a vital cog in community liaison. "Everyone knows Lemein – he's the Raptor Guy," says Stratton.

I don't meet Lemein in person – he's in Cape Town, completing his master's on raptor nesting behaviour – but we chat on the phone. He tells me he's monitored more than 400 nests, setting up remote cameras and tagging young birds to map and record their movements. "When I have a bird in the hand, I feel that connection," he says. Equally vital is Lemein's educational role, speaking to people in his own community about the importance of raptors. "People don't hate raptors. When I explain the chain of poisoning, they don't feel good – it's not what they intended."

OVER THE FOLLOWING DAYS, Doug and I explore the conservancy and adjoining stretches of park. Raptors abound, from lanky secretary birds to dinky pygmy falcons, and we meet the megafauna that pulls in the punters: nodding lines of zebras, browsing giraffes, breeding herds of elephants. Banded

The unmistakeable secretary bird is the tallest raptor in the world at 1.5m tall

Raptors such as the tawny eagle are key to ecosystems

TAWNY EAGLE: HEMIS/ALAMY

mongooses dash across the track, barbets and tchagras serenade us from the thickets, and the air is heady with wild thyme.

But breeding raptors remain the goal. Following Lemein's directions, we head for the Sand River, where a pair of martial eagles have long held a nest site. We find this massive structure unoccupied, with one of the adults perched nearby, looking grumpy. It's worrying. Has breeding failed? Did this bird lose its partner?

On our return, we run into a pride of lions. As we watch the cubs cavorting in the evening light, Doug tells me how, in February, this very pride lost seven members to a poisoning incident. Hyenas died, too, and who knows how many vultures.

AND HEREIN LIES THE BIGGER issue. Raptors are not only magnificent creatures in their own right, they are also integral to the Mara's infinitely complex ecosystem. Each species plays a vital role, whether as a predator, keeping the food web in balance, or – in the case of vultures – as waste-disposal merchants, breaking down carcasses, recycling nutrients and averting disease. Lose the raptors and you lose much more besides.

A few individual birds get help. On my way to Olderkesi, I visited the Naivasha Raptor Centre, a KBoPT facility where sick and injured raptors are sent for repair and rehabilitation. Director Shiv Kapila showed me around, introducing the birds by name. We entered a small enclosure to meet Horace the lappet-faced vulture, who promptly showed off his 2.7m wingspan and tilted his meat-hook bill at my face. A seriously formidable animal.

Shiv explained how birds that recover are released with a GPS transmitter to track their movements. He also told me about his education programme, receiving two school visits per week. "Kids arrive with a negative view of owls and vultures," he told me. "But we get them onside – we talk about pest control and preventing disease."

A dapper augur buzzard watched from the next enclosure. "Electrocution," Shiv explained. "These guys perch on powerlines. If they turn their head, they're dead." He described how a single electrocuted raptor can cause a costly local power outage. "Putting the lines underground or retrofitting them is expensive in the short term," he said, "but it would solve the problem in the long run."

Back in Olderkesi, conservancy warden Nathan Kipees shows me around the 'holding centre' – a large shed complete

Shiv Kapila forms close bonds with recovering raptors, such as this lappet-faced vulture

> “The fate of the Mara’s raptors hinges on the skill and dedication of a handful of exceptional individuals”

with water bowl and perching branch, where he tends to poisoned raptors. He explains how he feeds them an emetic to vomit up toxins and a glucose solution to restore energy. Under Nathan’s care, 24 vultures have been rehabilitated and released. Another eight requiring further treatment have been sent to Shiv at Naivasha.

As the week passes, I’m sensing that the fate of the Mara’s raptors – indeed, the fate of raptors across Kenya – hinges on the skill and dedication of a handful of exceptional individuals. What they need is support, and that’s where tourism comes in. “The community-owned conservancy movement is incredibly important,” says Stratton. He stresses the need to lease more land for conservation and how giving raptors a higher profile could help. In this respect, Cottar’s involvement is promising. The company now offers a dedicated raptor safari with exclusive access to the KBoPT’s work, visiting monitored nests and witnessing fascinating behaviour in the company of experts. The safari price includes a contribution to the trust, which helps fund its projects – at present, for example, enabling Lemein to complete his master’s degree. And guests won’t miss out on other wildlife: wherever the birds take you, there will be big cats, elephants, the whole Mara menagerie. You can’t avoid it.

ONE AFTERNOON, DOUG TAKES me to a natural spring called Ol Pilagilagi. We head out on foot – Doug with his rifle – following fresh elephant tracks along a stream that winds up a forested hillside. Baboons bark their displeasure. Finally, we reach a clearing. “This is where we’ll put the treehouse,” announces Doug.

He explains that Lemein has planned a nest platform on the hillside opposite to attract the resident crowned eagle pair, bringing them within view of Cottar’s guests. Meanwhile, at a salt lick below, a camera trap has already recorded a leopard, a serval and a black rhino. A night in this treehouse might be one to remember.

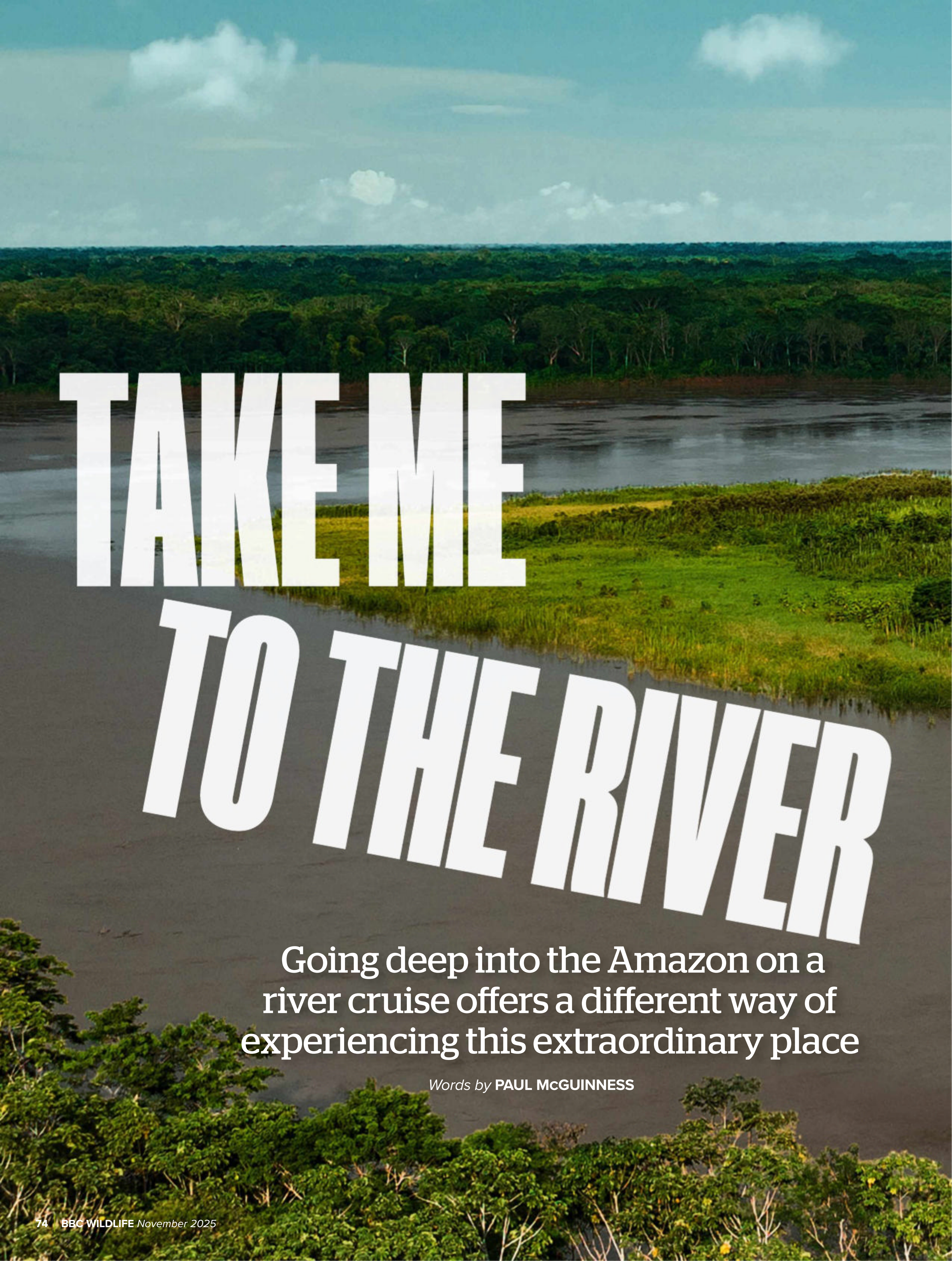
IT’S MY FINAL MORNING. WE’VE been out since dawn, watching bat-eared foxes and spying a brown snake eagle, my 21st raptor species of the week. As the day warms, Doug spies a distant, descending spiral of vultures. There must have been a kill. We change course, bumping and lurching over the savannah. Approaching the scene, we see individual birds on nearby trees, either awaiting their turn to feed or already sated. A single white-headed vulture – the Mara’s rarest species, with just three pairs remaining – is ousted from its perch by a feisty tawny eagle.

On the ground is a hissing, jostling scrum of vultures, tearing into the remains of a zebra foal. “Leopard,” says Doug, pointing to some telltale pugmarks. “He’s somewhere nearby.” More birds swoop in, scattering jackals as they alight.

It’s gruesome but mesmerising. I count them: 52 white-backed vultures; six lappet-faced vultures; two Rüppell’s griffon vultures; one white-headed vulture; one tawny eagle. Meanwhile, a bateleur tilts overhead on seesaw wings and a dark chanting goshawk stands sentinel atop a whistling thorn.

It’s raptor paradise, a vision of how things once were across the savannahs of Kenya and how – with the help of the inspiring team I’ve met this last week – they still could be once again. ●

The pygmy falcon is the smallest raptor in Africa, measuring about 20cm from head to tail



TAKE ME TO THE RIVER

Going deep into the Amazon on a river cruise offers a different way of experiencing this extraordinary place

Words by **PAUL McGUINNESS**

A river cruise along the Amazon offers 24/7 wildlife watching

RIVER BOAT: AQUA EXPEDITIONS

The blind pink Amazon river dolphin, or boto, lives only in freshwater

IT'S MY LAST MORNING IN LORETO, PERU, AND I'M up with the lark in the hope of finally seeing my first toucan. I've got coffee and my binoculars, and I'm on the deck of the *Aqua Nera*, the boat that's been my home for the past week.

The coppery-chested jacamar, *Galbula pastazae*

Flooded forest makes up most of the vast Loreto region

We're moored on the Amazon River and the number of birds I can see is staggering. Blue-headed parrots dance among the branches. Brightly coloured jacamars call from tree to tree, occasionally flitting over my head to perch on the boat, before darting off just as I train my camera lens. To my left, two black vultures hunch on a rickety looking branch, for all the world looking like the Scouse vultures in Disney's *The Jungle Book*. I imagine them sardonically mocking my fruitless search.

This is my second time in the Peruvian Amazon – I didn't see a toucan on my first visit either. I'm soon distracted from the trees by movement in the water, and sure enough a pod of botos – pink Amazon river dolphins – plays around the end of the boat. I've watched them every morning around this time. The thick, cocoa waters of the Amazon make it hard to pick them out beneath the surface, but I soon learn to watch for small fish flying through the air as the dolphins play with their food. Further from the boat, I notice smaller, grey tucuxi dolphins. It's hard to choose which pod to watch.

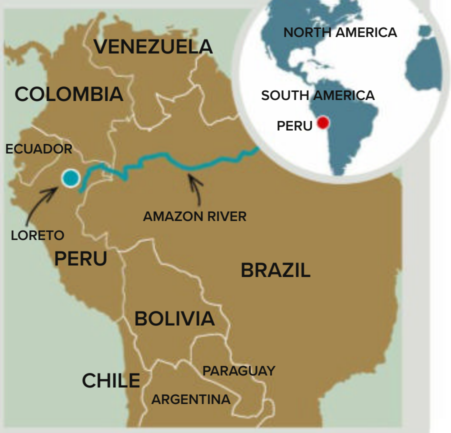
I think back to my arrival last Monday. Leaving Lima, my flight rose through the Pacific mist, the rugged Andes spiking through the clouds before the mountains quickly gave way to the edges of the jungle. It's this juxtaposition that gives the Amazon such a rich diversity of life.

We landed at Iquitos, the largest non-island city in the world that's inaccessible by road, and the capital of the Loreto department, a flooded forest region that borders Colombia, Ecuador and Brazil. Many

ABOUT THE AUTHOR

Paul McGuinness is the editor of *BBC Wildlife* and has a particular passion for the wildlife and culture of the Americas. He visited Loreto courtesy of Aqua Expeditions.

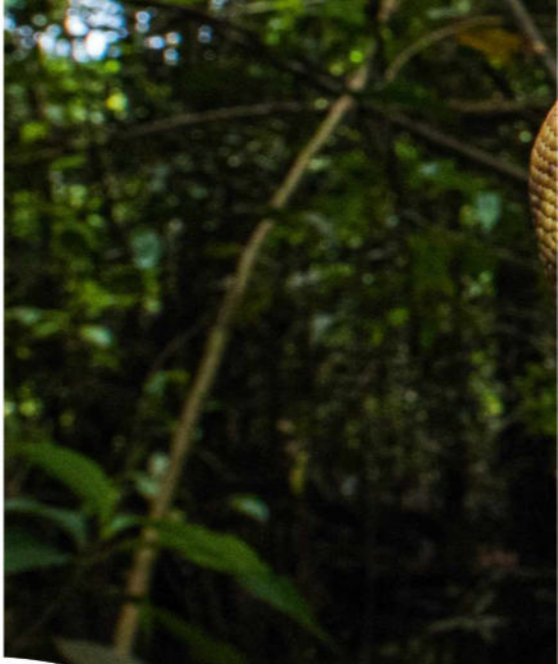
Where is Loreto?



Loreto is an Amazonian region in north-eastern Peru bordering Ecuador, Colombia and Brazil. Iquitos, its capital, is the largest city on Earth unreachable by road.

BOTO: BRANDON COLE/NATUREPL.COM; YELLOW-HOODED BLACKBIRD: IMAGEBROKER.COM/ALAMY; LORETO: VW PICS/GETTY; MAP: GETTY

The lettered aracari is one of the 18 elusive members of the toucan family in Peru



Leafcutter ants can lift up to 50 times their own body weight

of the houses are built on stilts, or designed to float when the waters rise. But as this is November, the end of the Amazon's dry period, water levels are low (the river level varies by a good 10m here from wet to dry season). A skiff takes me half-an-hour or so upstream to the *Aqua Nera*, a kind of floating boutique hotel. The drama of the approach is thrilling, heading towards a boat hung from the back with kayaks and skiffs, promises of adventures to come.

I'm here for a number of reasons, but what intrigues me most is to discover how different an experience staying on the river will be to when I had stayed near Puerto Maldonado in the more mountainous south 14 years ago. That trip was an incredible experience, but staying in a lodge meant following well-trodden trails through the jungle, and watching wildlife from canopy walkways and observation decks. Would a river cruise prove to be a more immersive experience?

After a welcome drink and snack, and an even more welcome shower, I'm keen to get out on to the water. Dusk brings the first outing, and with it come a number of wildlife sightings I'll never forget. Our skiff turns off from the Amazon's brown waters into the black water of a creek. Our guide, Alejandro Enriquez Aguilar, points out the extraordinary nests of weaver birds as we go, dangling like coconut husks on long strings beneath branches where monk saki monkeys sit. We exchange happy greetings with children splashing around in the water.

Channels begin to open up and we moor along a brook that, in a matter of weeks, will be a lake. The change in seasons shapes the landscape here, even relocating villages as erosion moves the higher ground and reroutes the river. Beneath a tree where a sloth sleeps, juvenile caimans lurk in the long grasses. The air is thick with the sound of an astonishing frog chorus. As night falls, and I look at the moon and stars, I realise that the trees are topped with what must be over a thousand cormorants, silhouetted against the sequined sky. I don't know how long we sat there, gripped, or when we left, but I do remember the fireflies that danced along the riverbank in the spot where we'd seen those children swim earlier. Back on board, as much as I'd been looking forward to a pisco sour on the deck, the day had caught up with me and I took myself off to bed.

At daybreak, I pull back my curtains to see a motorised canoe loaded high with bananas pootle by. Smoke rises from beyond the treeline as locals make charcoal to sell to the Chinese restaurants in Iquitos, by now the best part of a day's travel away. The big draw of staying on the river is waking up in a different place to where I'd gone to sleep, and I race up the spiral staircase to the deck.

A short skiff ride away I find myself on my third boat of the day – a kayak – and it isn't yet 8am. It begins to rain gently, and I spot a kingfisher flit along the opposite bank. As I get closer, it flies 50m or so further downstream, repeating this for maybe 1.5km as I slowly follow it.

Before coming out here, people had asked me what I was going to the Amazon

TOUCAN: MATEUSZ PIESIAK/NATUREPL.COM; LEAFCUTTER ANT: MARK BOWLER/NATUREPL.COM; TREE BOA: DANIEL NUNEZ/NATUREPL.COM; CORMORANTS: JANET HORTON/ALAMY

Amazon tree boas constrict their prey live and whole

to see. It's an understandable question – after all, many wildlife trips have a quest element: whale-watching boats hope to spot an orca; an African safari comes with a list of the Big Five to be ticked off. But, despite my dreams of spotting a toucan, you don't go to the Amazon to see something specific, you go there to see it all.

Like an increasing number of wildlife operators in the region, my boat is staffed by local Indigenous Amazonians such as Alejandro. Over lunch I pick his brains about the importance of wildlife tourism here. He explains that while it's crucial to many businesses in Iquitos, the people who live out in the remote jungle are far less reliant on it. "We always have something to eat every day. I don't have money in my pocket, I have fish in the water. I plant banana. I plant yuca." Alejandro explains how life in the Amazon is changing. The promise of education means a lot of younger people leave for the city and never return. He himself left his remote village close to the border with Ecuador, some 15 days' travel away, as a child and has never been back.

In other areas, logging and petroleum industries threaten the jungle, but Alejandro proudly tells me it's not such an issue here, that local communities band together to protect their region. "We understand this is the last resource we have. Local people don't make big damage. Who makes big damage is the companies – lumber companies especially. But in this section we are in a very good condition taking care." Signs along the rivers dictate which areas can be visited by tourist boats and which are off limits. Everyone respects them.

And so my week passes. By spending day and night on the water, I learn to read

"By spending day and night on the water, I learn to read the rhythms of the jungle, dictated by the river"

Neotropic cormorants flock in vast colonies, into the thousands

The brown-throated sloth is a surprisingly agile swimmer and climber

River cruises like *Aqua Nera* are mini wildlife sightseeing hotels

> “Bullet ants pack the most painful sting in the world”

the rhythms of the jungle, as dictated by the river, the tides, the weather. Every day there is a choice of excursions. I pass on the piranha fishing, opting instead for a jungle walk, and I thank the forest gods I do as I am richly rewarded with bountiful wildlife.

Being back on terra firma (or at the very least, terra slippy), feels strange and it’s while watching my footing that I notice the leafcutter ants. Like something out of a cartoon, they carry hunks of leaves through the small volcano-like opening of the nest. Close by, at the base of a tree, Alejandro points out a colony of bullet ants. These are the largest species of ant, and pack a sting generally considered the most painful of any creature in the world. Alejandro tells me of a rite of passage in some Amazonian communities that involves thrusting a hand into a glove filled with these ants to demonstrate suitability for marriage. The pain is agonising and lasts for days.

As this sinks in, an arboreal inhabitant has come to check us out. A juvenile brown-throated sloth reaches out to me from its tree. I step back, careful not to engage too closely, but this year-old sloth seems as fascinated by me as I am of it. After a few minutes entranced, I force myself to leave it be, and soon spot a pink-toed tarantula.

Overhead, a young boa snake makes its way through the branches. Monkeys howl, raptors screech and, in a clearing, giant *Victoria amazonica* lily pads wallow in mud that will be part of the river by Christmas. As parrots swoop through the canopy, I idly wonder if today will bring my first toucan sighting, but immediately chide myself. Have I not seen enough today without wanting more?

Before I know it, my final morning arrives, and I’m packed and ready to leave the *Aqua Nera* still without having seen a toucan. As another ringed kingfisher whizzes gracefully by in a blur of reds and blues, I begin to fantasise that the toucan is actually an elaborate hoax. After all, if you were going to make up something absurd, it may well look like a toucan.

Then a flash of black and yellow catches my eye. It couldn’t be… could it? So many tales from the bush end with a miraculous last-minute sighting of a long-yearned-for species that it would almost be too much of a cliché to see one now – although I’d take it.

The flash settles into a recognisable shape in the vegetation: it’s not a toucan. But I decide that this, my first sighting of a yellow-hooded blackbird, is a great way to bow out and I head below decks to grab my bags and begin the slow journey back to Iquitos, with its markets and restaurants, roads and hotels, leaving the river and the jungle behind.

When friends ask me what I saw, it’ll be hard not to sound smug. “I saw the Amazon,” I’ll think to myself while showing them photos of sloths, birds and dolphins. And, really, what more could I wish for?

BROWN-THROATED SLOTH: ROBERT HARDING/ALAMY; BOAT: AQUA EXPEDITIONS

ADVERTISEMENT FEATURE

NEXT-LEVEL NATURE

See whales, puffins and more against a backdrop of icebergs in Newfoundland and Labrador, Canada

Gannets

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See icebergs up close

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UNDER THE WAVES

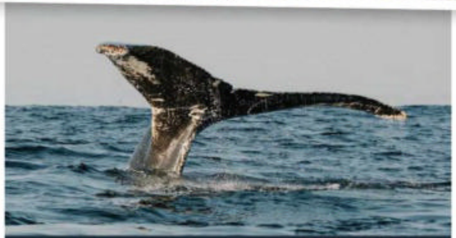
With over 29,000 kilometres of coastline, you're never far from the ocean in Newfoundland and Labrador – making it one of the best places on Earth to see all kinds of whales, especially humpback whales. The world's largest population of humpbacks is found here, returning year after year to feed in the nutrient-rich waters. Join a whale-watching boat trip for the chance to see whales and dolphins breaching the waves or try and spot these majestic cetaceans from land, on one of many coastal hiking trails. The best time to see the whales is from May to September, which coincides with the season for iceberg viewing. Go on a guided sea kayaking tour to experience both of these iconic wonders up close.

TO THE SKIES

Often called the seabird capital of North America, Newfoundland and Labrador is home to over 350 species of bird. From land or sea, you can see millions of seabirds, including gannets, storm petrels and black-legged kittiwakes, at one of several world-class birdwatching hotspots. Visit Witless Bay Ecological Reserve, the largest puffin colony on the continent, to see more than 500,000 Atlantic puffins – the provincial bird of Newfoundland and Labrador. The best birdwatching opportunities occur in late spring and summer, which again, matches up with prime iceberg viewing season – the huge blocks of floating ice provide an unbelievable backdrop for bird photography.

Reach the land of whales, birds and icebergs in under six hours. Direct flights from London Gatwick to St. John's, Newfoundland and Labrador, run from April to October.

Visit **newfoundlandlabrador.com** or call **+1-800-563-6353** for more information



HELLO HUMPBACK

Hello Humpback is a first-of-its-kind digital experience for Newfoundland and Labrador tourists. Upload a photo of a humpback whale's tail (also called a fluke) to learn their name and story. Every whale's fluke is unique, meaning you can identify whales, record sightings and contribute to citizen science.

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Images: Destination Canada, Jackie Zheng

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Q&A

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wildlifemagazine@ourmedia.co.uk

What's the world's largest national park?

NATURAL AREAS HAVE BEEN GRANTED a wide variety of protections, according to local, national and international standards. But Greenland takes the cake on a national level.

Northeast Greenland National Park is the largest national park in the world. Created by the government of Denmark in 1974, it was later expanded in 1988. The park now encompasses an area of 972,000 km^2 – larger than many individual countries. Some 80 per cent of the area is covered by the Greenland Ice Sheet – the world's second-largest body of ice.

There are few permanent residents. Around 40 people inhabit a variety of research stations posted along the coast and a naval unit that operates using dog sleds patrols parts of the region. The Inuit settlement of Ittoqqortoormiit is the nearest permanent settlement. While some residents still make their living hunting native wildlife, others have turned to tourism. And many young people leave. Economic instability – and the threat of polar bears – are a constant for the approximately 350 citizens.

The park itself is home to a variety of Arctic wildlife. As well as polar bears, it hosts Arctic foxes, musk oxen, walruses and several seal species – and 90 per cent of the Greenland wolf's total population. The coastal areas are home to narwhals and beluga whales as well as gulls, skuas, puffins and plovers. **Richard Pallardy**

Greenland National Park is more than 100 times larger than Yellowstone

GREENLAND: RAIMONDO RESTELLI/500 PIX/GETTY

IS A RIVER ALIVE?
What is the rights of nature movement – and how does it actually work? **p84**

FRIENDS FOREVER
Are animals capable of forming friendships with other animals? **p87**

A STING IN THE TAIL
Which insect has one of the most painful stings in the world? **p92**

The Los Cedros Reserve was established in 1988 and is located in north-western Ecuador

What is the rights of nature movement?

The rights of nature movement argues that non-human natural entities and ecosystems, from rivers to woodlands and coral reefs to savannahs, are not mere property but rights holders in law. Just as the human rights movement sets out the fundamental rights of people, the movement sets out the inherent right of natural entities and ecosystems to exist and thrive, irrespective of their usefulness to humanity.

The movement dates back to the publication in 1972 of *Should Trees Have Standing?*, a legal paper arguing that nature possesses legal rights. That same year, the United States Supreme Court heard a case about the development of a ski resort in the Sierra Nevada mountains, in which one of the dissenting justices concluded that natural resources should be able to sue for their own protection.

The case brought the theory of rights of nature to the legal mainstream, but it took more than three decades before these ideas actually made it into law. In 2008, Ecuador ratified a new constitution that recognised the rights – known as *Pacha Mama*, or Mother Earth, in Andean Indigenous philosophy – to "integral respect for its existence and for the maintenance and regeneration of its life cycles, structure, functions and evolutionary processes". Indeed, the success of the movement in recent years is reflective of a shift towards a greater understanding of and respect for First Nation culture and knowledge worldwide.

> "Citizens can file lawsuits on behalf of ecosystems"

In practice, this means that citizens can file lawsuits on behalf of ecosystems, and courts have additional powers to block extractive projects and order the restoration of habitats. The constitution was vital in protecting the Los Cedros Biological Reserve, after a case was brought to court when a mining company began explorations in the site. In 2021, the judge ruled that mining would harm the biodiversity of the forest and violate the rights of nature.

The rights have also been conferred by courts in several nations and regions.

LOS CEDROS: GERRY ELLIS/MINDEN/NATUREPL.COM

For example, in 2019, in a case regarding pollution of the River Turag, the High Court of Bangladesh declared the waterway to be a living entity with legal rights. The ruling applies to the country's other rivers, too. The court appointed the National River Conservation Commission as guardian of the river, using a legal framework familiar from cases where a court acts in the interests of a child.

Elsewhere, on the South Korean island Jeju, campaigners and environmentalists are seeking to have a pod of around 130 bottlenose dolphins recognised as a 'legal person', in an attempt to grant them further protection by law.

In the UK, there are no national laws relating to rights of nature. But in 2021, Derry City & Strabane District Council became the first council in the UK to pass a motion in support of such rights. Several councils in England have taken similar steps since, passing motions to grant their local rivers fundamental rights, including the right to be free from pollution. While this action is largely symbolic – as council motions do not overrule national law in the UK – advocates of the movement are encouraged that such ideas are now part of mainstream politics.

"Central to these laws is the idea of guardianship"

It's not just in the UK that this legislation remains complex. Central to most rights of nature laws is the idea of guardianship – that a person or organisation will represent the natural entity in court. Yet guardians tend to be underfunded, particularly in comparison with vested interests such as extractive industries or governments. As a result, some experts believe that the rights themselves are less a tool for protecting nature and more a way of shifting the conversation towards legal frameworks that will ensure better protections in the future. **Jo Caird**

Bottlenose dolphins in Jeju could be granted legal status

Los Cedros in Ecuador protects more than 200 species at high risk of extinction, including the Los Cedros rain frog

BOTTLENOSE DOLPHINS: BJ WARNICK/NEWSCOM/ALAMY; RAIN FROG: MORLEY READ/NATUREPL.COM

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Chimpanzees in the wild demonstrate bond-building behaviour

Elephants live in groups led by a matriarch

Can animals make friends?

There are many reasons why animal species band together with others of their kind – for protection in numbers, to achieve a common goal, to safeguard young or to maximise breeding opportunities. But are any of these relationships true friendships in our human understanding of the word?

We think of friendship as offering people we meet during our lives support without strings – not stemming from family ties, sexual attraction, personal gain or duty. Friendship works on an emotional level to enhance our lives in ways that cannot always be quantified. Although animals' emotions are hard to judge beyond the obvious outward expressions of irritation, anger and fear, according to scientists this form of inner bond also occurs in many non-human species.

Pet owners recognise inter-species relationships between cats and dogs, horses and donkeys. Dairy farmers report animals in their herd that seem to form deliberate grazing groups with some cows but not others – they even exhibit dislike of some individuals, driving them away from their friendship group. Elephants are well known for forming bonds with unrelated elephants, travelling together and visibly mourning when their companions die.

"Pet owners recognise inter-species relationships"

Friendship alliances do provide benefits to both parties, but the links don't seem to be consciously formed to achieve those benefits. Rather, they appear to be a by-product of a natural attraction. In many cases, the only conclusion is that the trigger for a relationship is simply friendship.

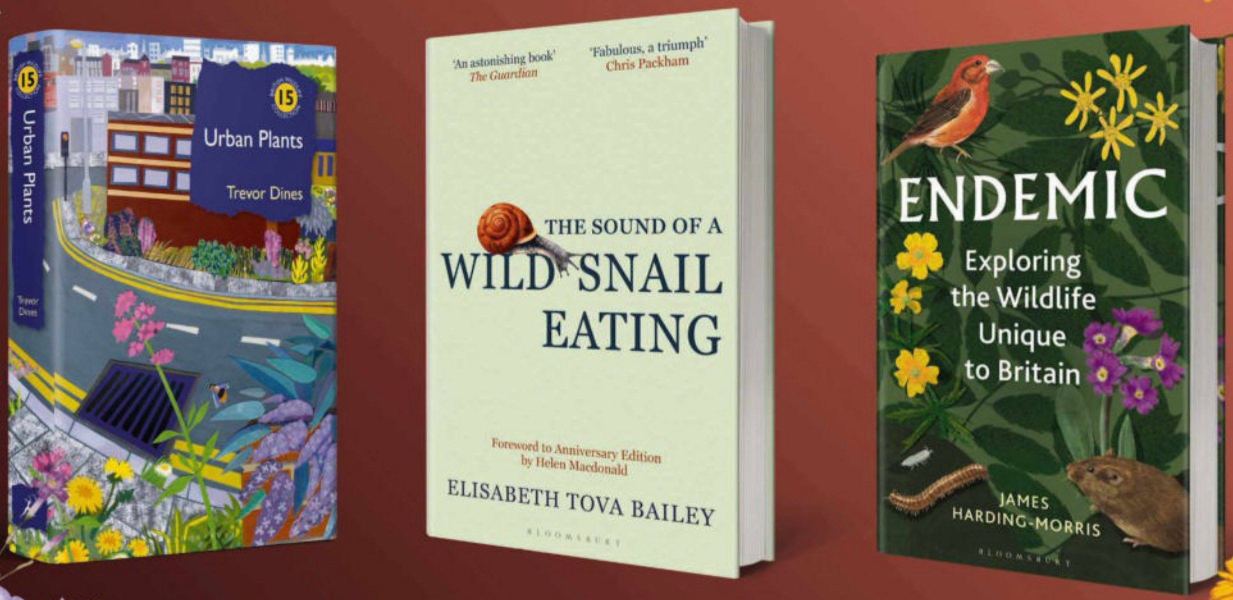
Separating the effects of alliances based on conscious self-interest from those stemming from altruistic companionship requires long-term observation. In a study of Eastern chimpanzees in Gombe National Park in Tanzania, researchers from Duke University in North Carolina, USA, analysed data on female chimps that had been collected over three decades, from a year before they gave birth to five years after. A significant number of females formed bonds with other, unrelated females. The scientists wanted to see whether unconditional 'friendships' had an effect on the survival rates of the young. Their conclusions were that being close to sisters and other female kin didn't necessarily bring benefits in offspring survival, but close relationships with non-kin females did.

"In species where females live in groups with their sisters and mothers, it's less surprising that female sociality is beneficial," says lead author Joseph Feldblum. "But female chimps don't usually have that. They are less gregarious than males, so the fact that forming strong social connections still matters is striking."

Sheena Harvey

CHIMPANZEES: ANUP SHAH/NATUREPL.COM; ELEPHANT HERD: DAVID STEELE/ALAMY

Explore the wild, one page at a time.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Who owns the ocean?

Blue whales undertake lengthy migrations

LAND CAN BE DIVIDED UP SOMEWHAT clearly (although there are disputes about who owns what), but what happens when it comes to water? Technically, no one owns the ocean, but some countries have jurisdiction in some seas.

According to a UN law, coastal countries or states with archipelagos have sovereignty over their territorial seas, which means waters up to 12 nautical miles (22km) from their shores, including the air above and the seabed below. However, this can be shorter if two states are closer together.

In the UK, the Crown claims ownership of nearly all waters within 12 nautical miles. People who want to use these waters for ports, windfarms or aquaculture projects must apply for a lease.

Landlocked countries don't have territorial waters, but vessels can access the seas for 'innocent passage'. If they're not doing things such as spying, using weapons or fishing, then they are allowed to pass through freely. Beyond that, coastal countries have Exclusive Economic Zones (EEZs) within 200 nautical miles (370km) – or less, if zones of different nations would overlap. Because of its overseas territories, including Guadeloupe, Réunion and French Polynesia, France has the world's largest EEZ.

> **"Travel further than EEZs and you reach the High Seas"**

Countries don't have as much control of their EEZs as they do over their territorial seas, but they can fish, drill for oil, lay undersea cables or even build artificial islands. They are also responsible for conservation measures and fishing quotas. Other countries can fish in that EEZ, as long as they follow any rules set out.

Travel further and you reach the High Seas. These international waters are outside the jurisdiction of any nation and make up two thirds of the ocean. Anyone can use the High Seas for travel, fishing or research, if they follow international laws.

Just 1.2 per cent of international waters are protected but conservationists are hoping to change this. In 2023, members of the UN agreed to adopt the High Seas Treaty, which aims for better protections. In September 2025, 60 countries, including the UK, had signed the Treaty – meaning the agreement will now become law.

The ocean is full of fascinating marine species, from tiny plankton to the enormous blue whale. While they're swimming freely, humans can't own these animals, and migratory species such as whales and turtles aren't aware of any boundaries set by humans. Yet, more than one trillion wild fish are caught each year. If someone catches a fish legally, they are generally considered the owner. **Melissa Hobson**

Hawskbill sea turtles are found in tropical and sub-tropical waters of all the world's major oceans

BLUE WHALE: ALEX MUSTARD/NATUREPL.COM; SEA TURTLE: SHANE GROSS/NATUREPL.COM

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Which animal has the best sense of direction?

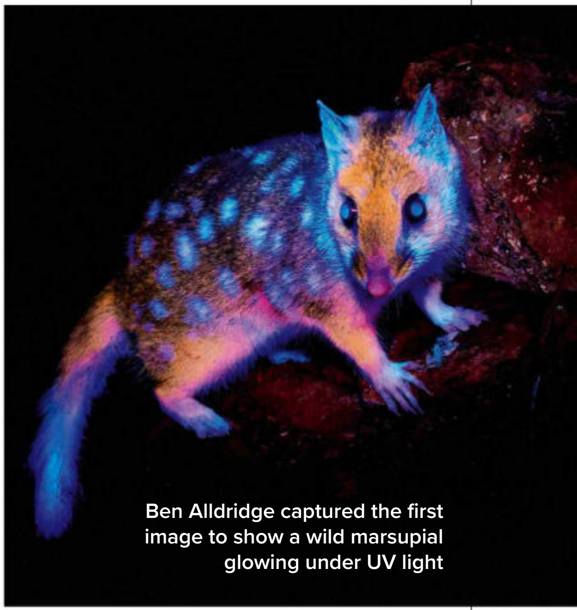
Domestic homing pigeons are famed for their acute sense of direction and uncanny ability to find their way home – sometimes from distances of more than 10,000km. During World War I, as part of his service in the US Army Signal Corps, a plucky little pigeon named Cher Ami flew 40km through intense German fire to deliver a critical message to American forces. His ability to fly with accuracy and speed saved the lives of 194 US soldiers and later earned Cher Ami the French Croix de Guerre medal.

How pigeons are able to do this is much debated, but it's clear that they use multiple strategies. On a sunny day, homing pigeons use the position of the sun, relative to its position in the sky, to help gauge their bearings. If it's cloudy, they use the earth's magnetic field, which they are able to detect via specialised cells, most likely in their eyes or ears.

When they find themselves in familiar territory, they look out for and follow key landmarks, such as roads and rivers. This indicates that the birds possess not only an internal compass, but an internal 'map' of their journey. Smell may also play a role in navigation, as may the low-frequency ultrasounds generated by waves and weather. **Helen Pilcher**

Homing pigeons are domestic pigeons bred for their navigation skills

Can mammals glow in the dark?



Ben Alldridge captured the first image to show a wild marsupial glowing under UV light

Bioluminescent creatures, such as glowworms, fireflies and oceanic algae that light up like underwater stars, produce their own light. This dazzling ability has evolved independently at least 100 times across the tree of life.

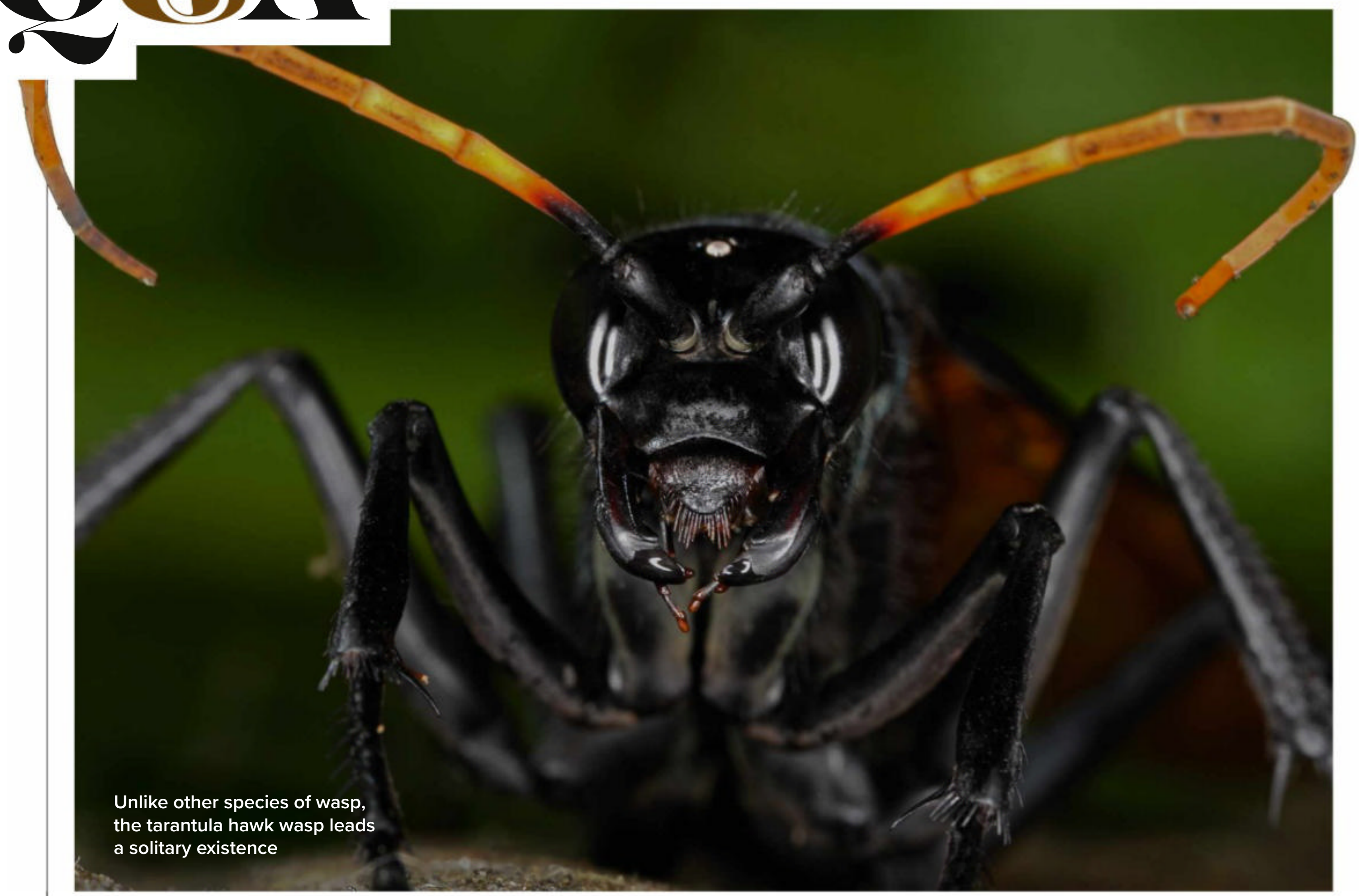
Within vertebrates, bioluminescence is unique to fish. Perhaps most famous is the anglerfish, a deep-sea fish that uses its bioluminescent lure to attract prey.

While there are technically no bioluminescent mammals, there are some mammals that 'glow in the dark'. Rather than producing their own light, these mammals absorb shorter wavelength light and then emit it as longer wavelength light that is a different colour – usually reds, oranges and greens. This is called biofluorescence and it tends to be visible to the human eye under UV light.

Biofluorescence is most common in marsupials. Opossums, platypuses, wombats and echidnas are all biofluorescent, as is the eastern quoll (above), whose glowing pelt recently made headlines. However, some non-marsupial mammals, such as flying squirrels, are also biofluorescent.

Why exactly biofluorescence has evolved in these species is unclear, but most are nocturnal or crepuscular (active at dawn and dusk), so living in the dark is thought to play a role. **Beki Hooper**

RACING PIGEONS: TERRY MATHEWS/ALAMY; QUOLL: BEN ALLDRIDGE



Unlike other species of wasp, the tarantula hawk wasp leads a solitary existence

ALL YOU EVER NEEDED TO KNOW ABOUT THE

Tarantula hawk wasp

BY JO CAIRD

Neither arachnid nor bird, the tarantula hawk is a large wasp (there are over 130 known species) that gets its confusing name from a fearsome habit of preying on tarantulas and other large spiders to feed its larval young. It is part of the spider wasp family and usually docile, feeding almost exclusively on nectar, but provoke one at your peril – their sting is one of the most painful in the world, second only to that of the bullet ant.

What do tarantula hawks look like and where do they live?

They have a blue-black or green-black body, often iridescent, set off by a pair of orange or amber-coloured wings that serve to warn potential predators that this insect is not to be messed with. This defensive colouring – the technical term is 'aposematic' – is effective: tarantula hawks have no predators. *Pepsis heros*, the largest species of tarantula hawk, can measure up to 11cm long, with a stinger of up to 7mm. Other species might grow to around 5cm long. Tarantula hawks are found all over the world, except in Europe and Antarctica. They are particularly common in Central America and throughout the southwestern United States.

What do these wasps eat?

Adults are nectarivorous, meaning they feed exclusively on nectar and pollen. Their larvae, however, are carnivorous and parasitoid, feeding on live prey provided for them by their mother. Having hatched from an egg laid in the body of a tarantula, the larva feeds on a fluid called haemolymph, the insect equivalent of blood and lymph.

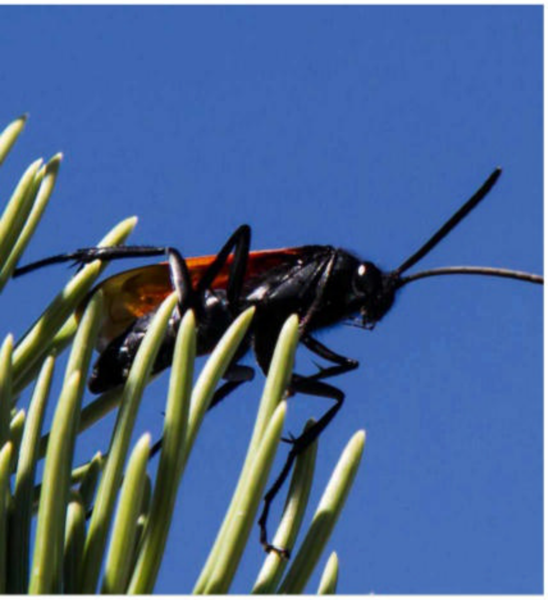
Is the stinger used to kill?

The female tarantula hawk uses her stinger for injecting a powerful venom into prey, but only to cause paralysis. Females are also equipped with hooked claws that they use to help pin down a spider. You can tell the sexes apart by looking at the antennae: the female's antennae are curved, while the male's antennae are straight.

How do the females hunt for prey?

Following mating, a female tarantula hawk will lie in wait outside the burrow of a tarantula or other large spider, tapping on the ground or strumming on a web to tempt her victim to emerge. After what might turn out to be a long fight – the tarantula hawk is often much smaller than its prey – she rapidly injects venom, via her stinger, into the spider's thorax. This venom paralyses the spider but crucially does not kill it – the tarantula hawk needs it alive to feed her larva. She drags the hapless arachnid to its own burrow or into one she has prepared (this may be some distance away), lays a single egg on the spider's body, and leaves, covering up the entrance behind her. Three or four days later, the egg hatches and the tarantula hawk larva burrows into the still-living spider's abdomen. Over

Attacking much larger adversaries like this tarantula poses little risk to the wasps



Top: Despite their killer characteristics, tarantula hawk wasps are nectarivorous
Above: Males sit atop tall plants or trees and watch for passing females ready to reproduce

the course of about three weeks, the larva consumes the spider bit by bit, going through five growth stages. The spider only dies once the larva has eaten its vital organs, which it leaves until last. It then spins a cocoon and pupates for 15 to 20 days, ultimately emerging from the spider, then the burrow, as an adult tarantula hawk.

Why do females pick such large adversaries?

While it might seem counterintuitive for the female to choose an adversary so much larger than herself, she does so for good reason. The larger the spider she leaves for her larva to feed on, the larger it will become as an adult wasp, and therefore the more likely it will be (if it's a male) to find a mate when the time comes for it to breed.

How do they attract a mate?

Female tarantula hawks fly to the top of mountain ridges to find males in territories they have secured in the trees. While the largest males occupy the highest, most desirable territories, a smaller male may try to intercept a female on her way up, or will take on a larger male to steal his roost. They do so by competing in dramatic aerial displays in which the wasps will spiral upwards for up to 30m before diving back down towards the tree in contention. Displays can last for up to an hour.

Are they dangerous?

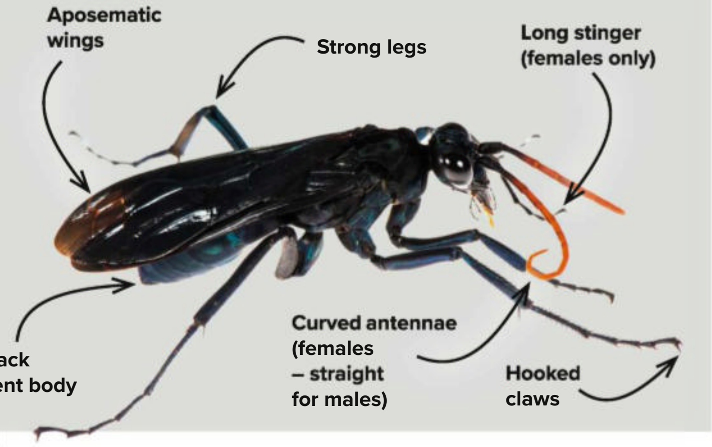
Despite the gruesome way they provide for their young, tarantula hawks are not dangerous to anything but their arachnid prey, unless provoked. If you do get stung, however, you'll certainly know about it, as the tarantula hawk's sting is one of the most painful in nature. The American entomologist Justin Schmidt, creator of the Schmidt pain scale for stinging insects, puts the wasp at number two on his scale, beaten only by the bullet ant. He described the tarantula hawk's sting as 'instantaneous, electrifying and totally debilitating', comparable to the pain caused by a running hairdryer being dropped into your bathtub. The one consolation is that this ordeal only lasts five minutes (victims of bullet ant stings can expect to suffer for up to 24 hours) and requires no medical attention.

How sociable are tarantula hawks?

They are solitary creatures, coming together only to mate. Unlike many other species of wasps, a female builds and supplies her own nests without the help of a colony.

A TARANTULA HAWK WASP'S SPECIAL FEATURES

Scientific name:
Pepsis
Family:
Pompilidae
Size: 5–11cm long
Weight:
Approx. 14g
Lifespan: 6–12 months for females; 2–3 months for males


Aposematic wings
Strong legs
Long stinger (females only)
Blue-black iridescent body
Curved antennae (females – straight for males)
Hooked claws

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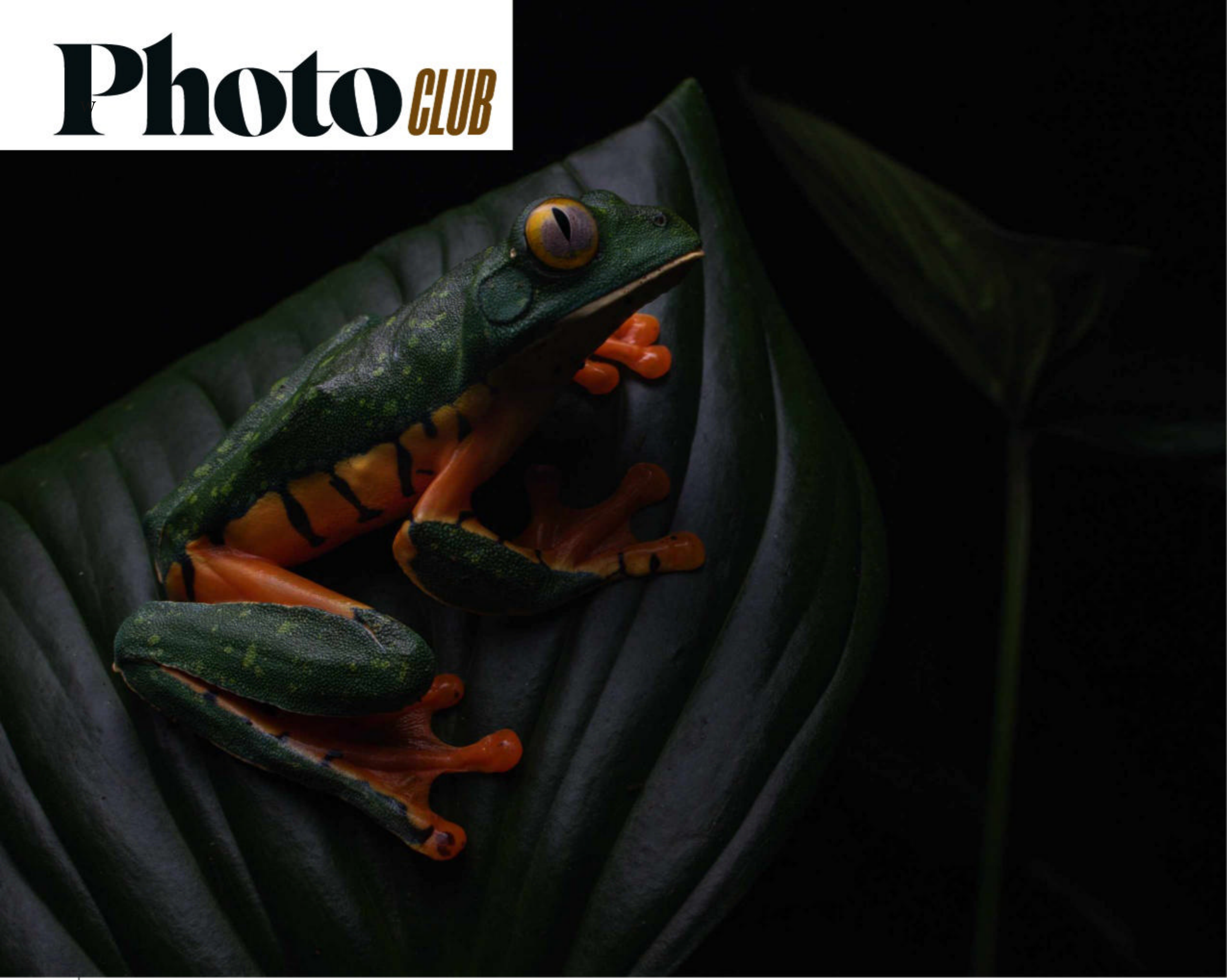
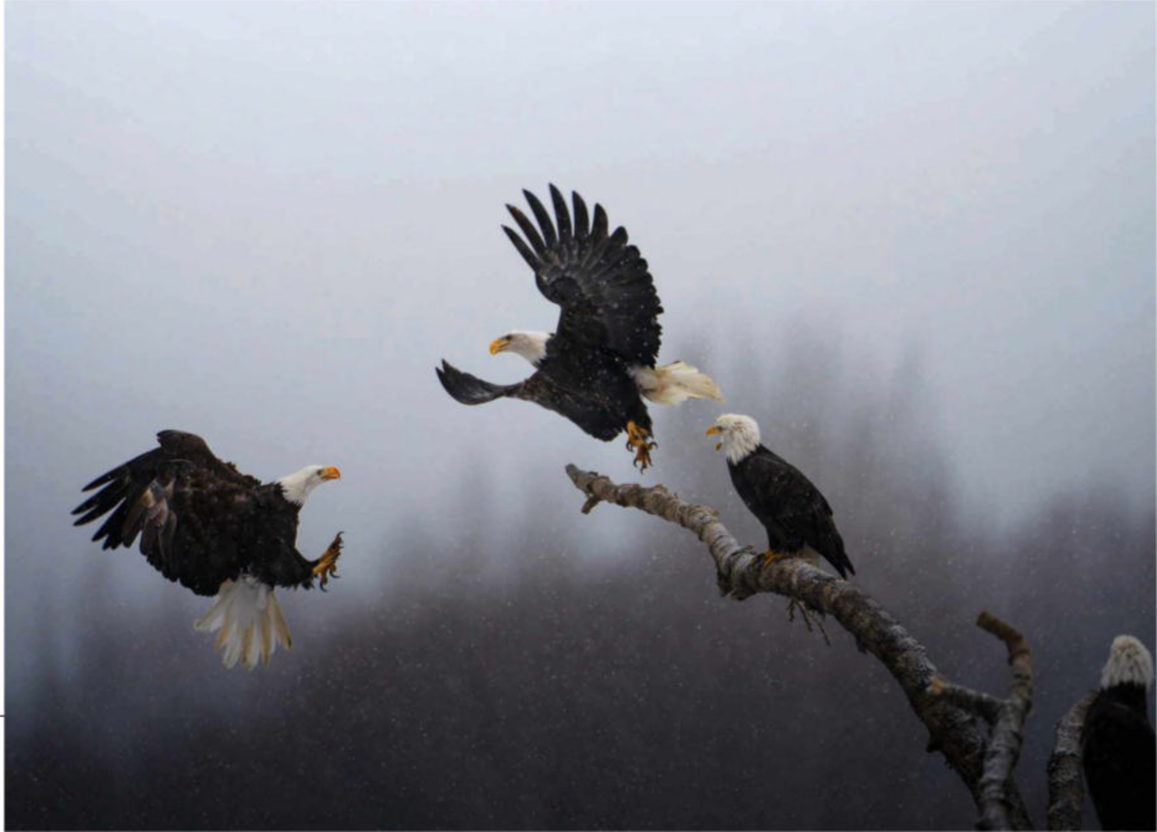


Leafy greens

We found this splendid leaf frog in the canopy on the Caribbean slope of Costa Rica. Females lay eggs on leaves overhanging pools formed in the cavities of trees so the tadpoles fall into the water.
Benjamin Luke
Tavistock, Devon

Hot spot

Every November, hundreds of bald eagles gather at Chilkat Bald Eagle Preserve in Alaska to feast on salmon. This branch was a popular hangout and commotion ensued when another eagle eyed the spot.
Karthik Subramaniam,
San Francisco



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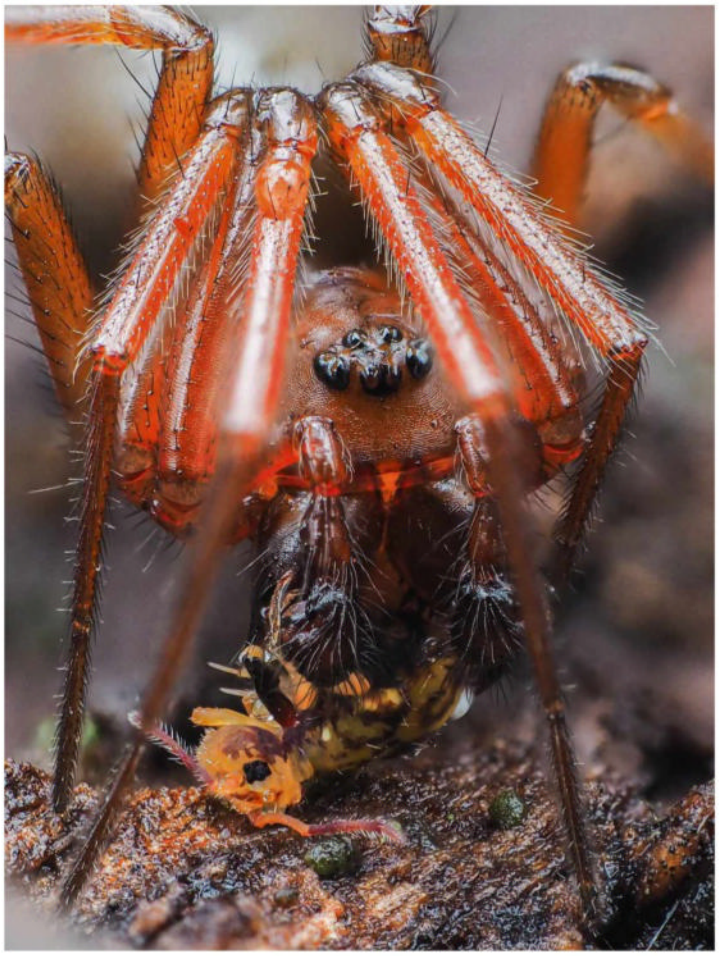
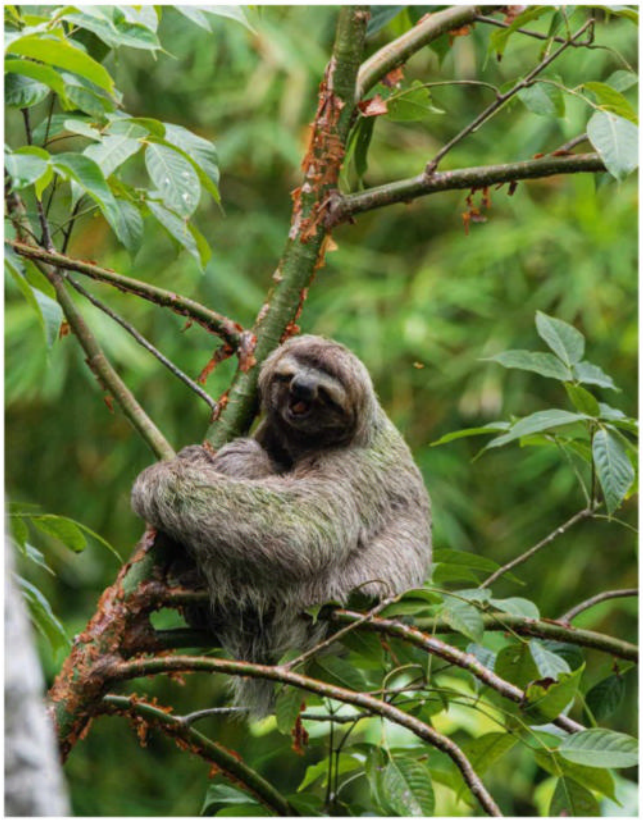
Lead the way

Despite missing a tusk, a bull elephant in Kaziranga National Park, Assam, tramps ahead to keep his 20-strong herd safe.
Aneesh Balakrishnapillai Kerala, India

Forest feast

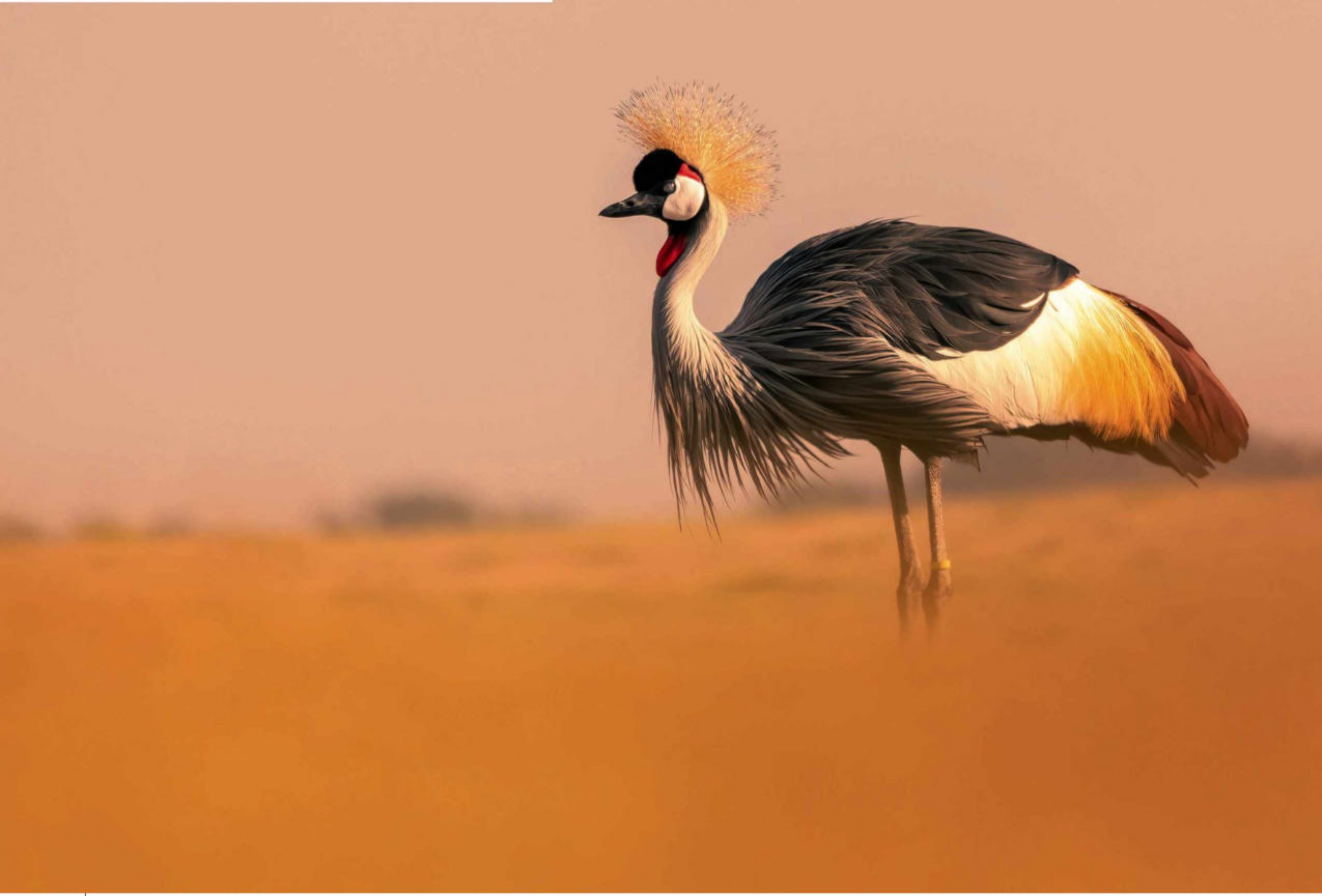
While I was looking for invertebrates on the forest floor at Cannock Chase, Staffordshire, I spotted this brightly coloured money spider eating a tiny globular springtail.
Ryan Dale, Stafford

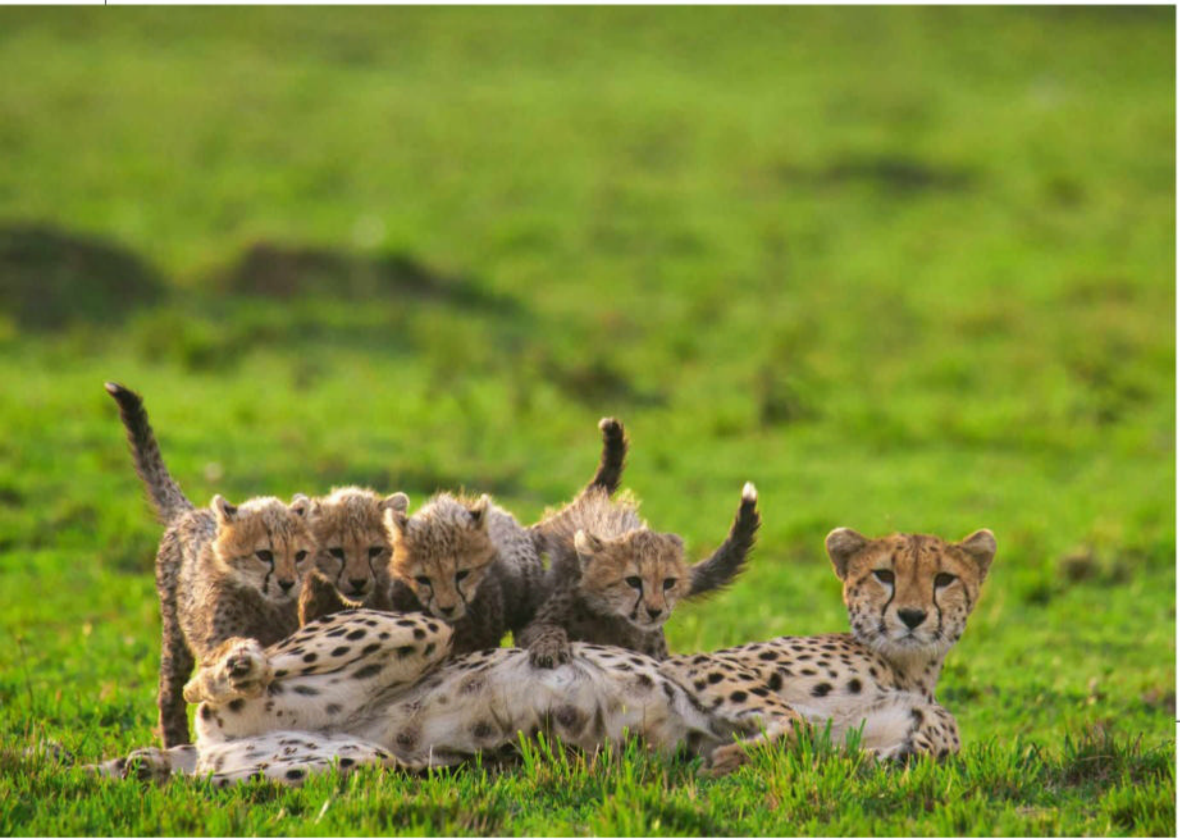




Easy does it

A three-toed sloth high up in the canopy in Manuel Antonio, Costa Rica, wakes for a yawn before returning to its nap.
Samantha Kreling, California, USA



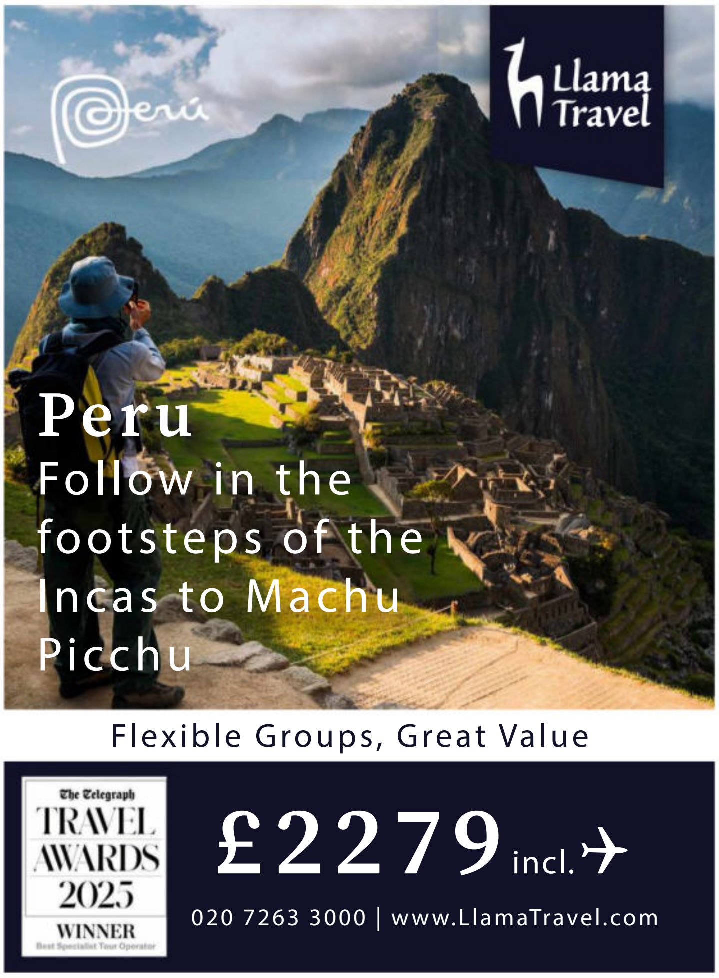


Best light

This grey-crowned crane is captured in the warm, golden glow of sunlight in the landscape of the United Arab Emirates, which highlights the striking features of this beautiful bird.
Kirtesh Mahant
Sharjah, United Arab Emirates

All in a row

While on safari in the Maasai Mara, Kenya, we came across this beautiful cheetah family. I waited patiently for about three hours for the cubs to pause from their play and come together for the shot.
Hema Palan,
Mumbai, India



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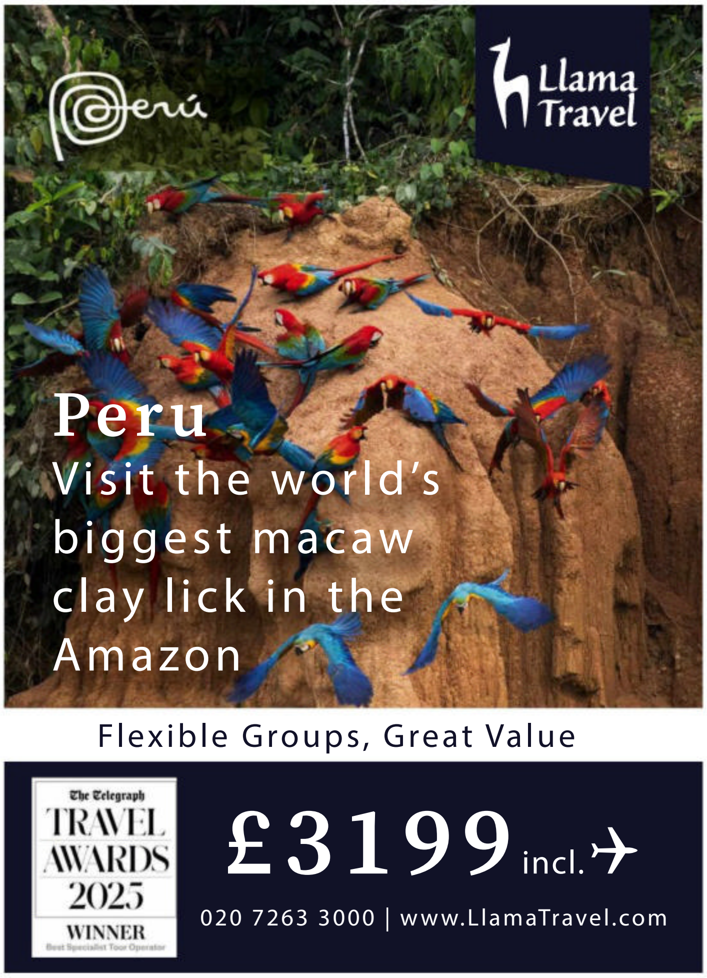

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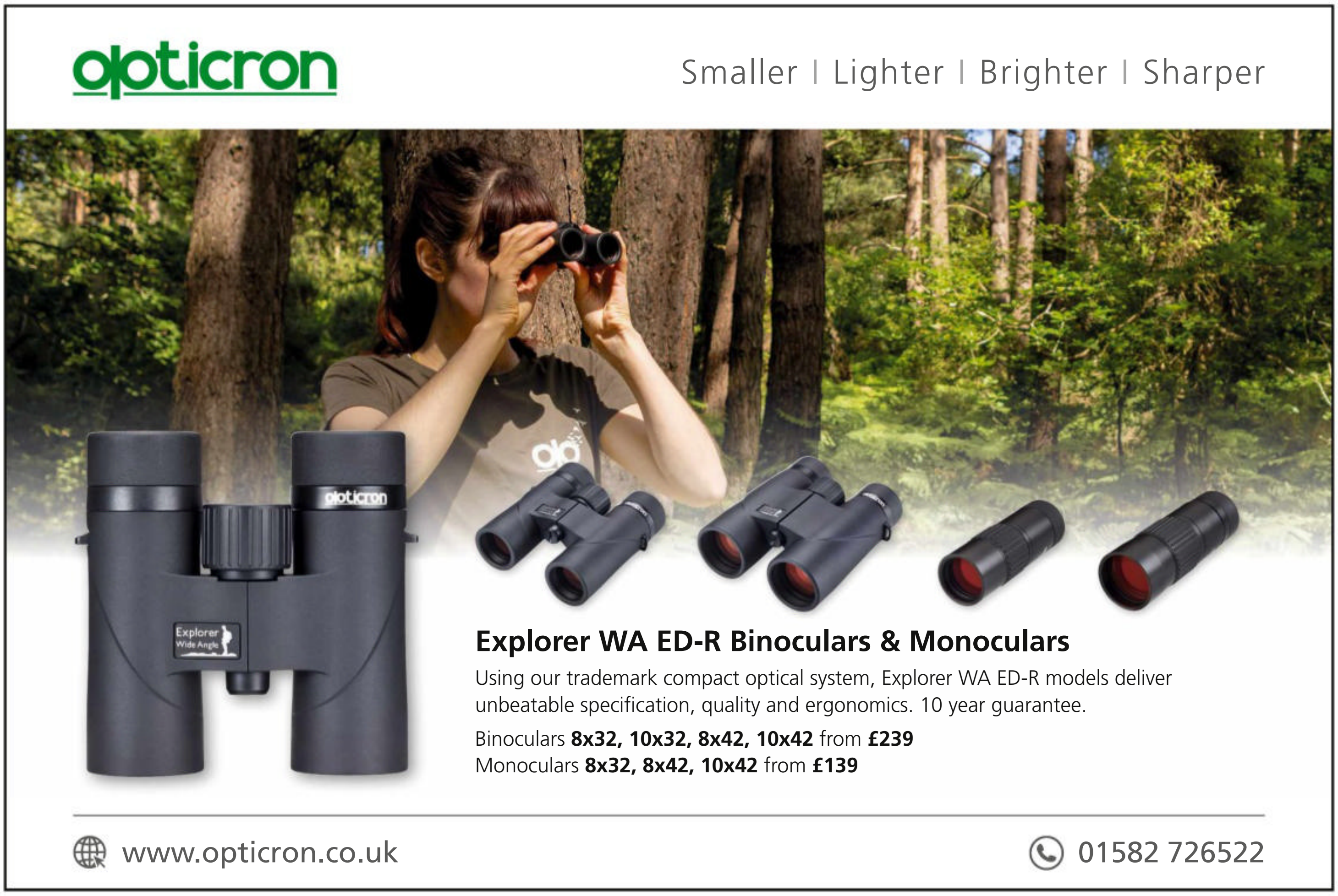

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Lauren's focus is on visual storytelling

SNAP-CHAT

THE INSIDE WORLD OF WILDLIFE PHOTOGRAPHY

Mountain highs and seafaring lows with Lauren Owens Lambert

How did you get into photography?

I learned about environmental reporting on a student-run publication, *The Planet*, at Western Washington University. Then I worked as a photojournalist for the city's *Bellingham Herald*. My mother passed on her love of photography and taught me a lot. But my career really launched when I was accepted by the International League of Conservation Photographers.

Which of your images is most important to you?

My image of saltmarsh sparrow researchers is colourful and bright. The bird is in the hand of a scientist in the foreground and in the background another scientist is recording information in the saltmarsh environment. Approaching stories with a human focus is my style, hopefully sparking curiosity in the viewer.

Do you have one unforgettable shoot?

The range rider story I did was a perfect combination of wildlife, agriculture and solutions-based journalism. It was my first professional story and we spent several days in the Cascades with cowboys and wolf biologists. We flew over the mountains, looked for wild wolves, went on a cattle drive and sat around the campfire listening to stories. I was doing what I always wanted.

What's been your most memorable experience with wildlife?

I had two amazing moments at Padre Island in Texas with Kemp's ridleys, the world's smallest and most endangered sea turtle. First I photographed a female laying her eggs – such primal behaviour, feeling the earth thump as she patted down the sand over her eggs – and I was there when the eggs hatched at night. Seeing them push up through the sand and take their first swim was a full circle moment. I continue to document their life stories to this day.

On assignment while pregnant

Have you had any close calls?

I was documenting research on lobster populations in a future offshore wind turbine site. We had a 2am departure on a small lobster boat to get to the site by sunrise. The waves were several metres high and I was so sick. I got to know the boat's 'puke hole' very well – but I still got the footage I needed!

Any epic fails to share?

On the saltmarsh sparrow project, I wanted to get a time-lapse of a nest with eggs flooding and the high tides only happen once a month at night. We worked for weeks planning it out. We set up the equipment and let it run but the tide just didn't come up high enough. We ended up with nothing.

Which species is top of your bucket list?

I'd love to photograph sea otters and the kelp forest habitat in the Pacific Northwest. They're one of my favourite animals and diving in the kelp would be beautiful. Another image I've been trying to make for years is an underwater split involving people and the Kemp's ridley sea turtle. It needs everything to line up – equipment, weather, people and lighting. I'll get it some day.

What's the greatest discomfort you've had to endure?

One time, making a film on Alpine lake environments, we had to climb vertical of 2,133m over a distance of 22km to get to the lake. I was young and in shape, but that hike with a backpack full of equipment was the hardest physical thing I've ever done.

Which kit would you not be without?

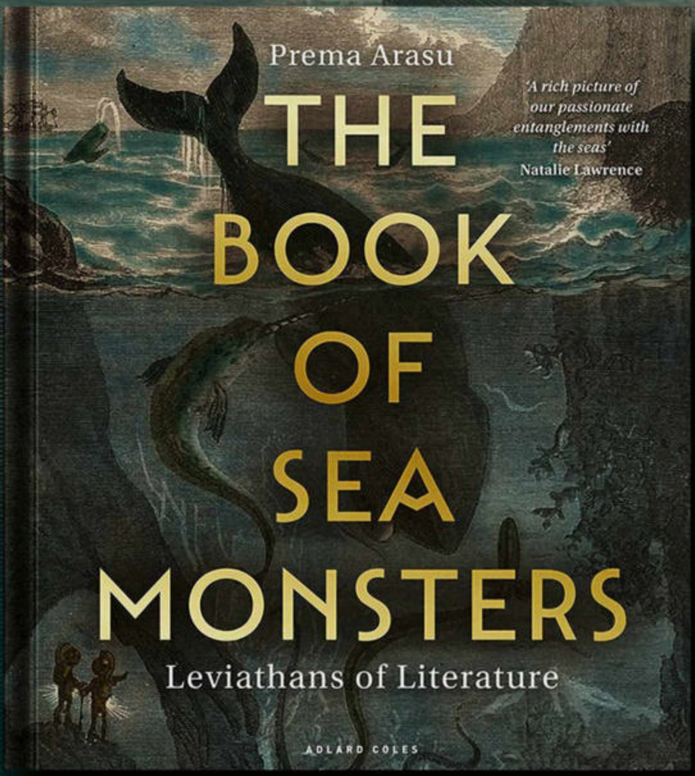
I would not go into the field without my small external flash and diffuser. Since my work typically focuses on people as well as wildlife, I work with a lot of subjects in close-up and it's nice to have an off-camera flash to add pop and focus to images.

Any tips for budding photographers?

Time is a photographer's best friend. These two quotes I made have inspired me: "If I do nothing, nothing will happen" and "If I do something, something will happen". Even one thing that moves a project forward makes for a successful day. So, take your time and try to do one thing every day.

Lauren Owens Lambert is a conservation photographer. See laurenowenslambert.com

PORTRAITS: LAUREN OWENS LAMBERT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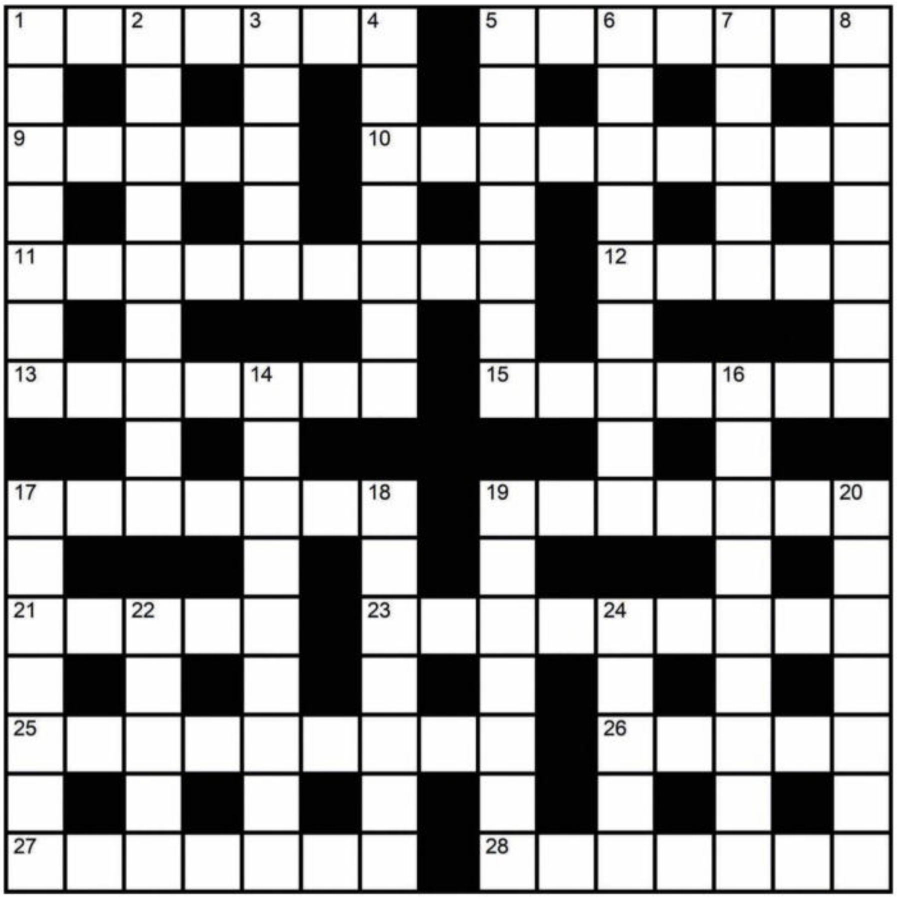
wild PUZZLES

The crossword



ACROSS
1 Marine bivalve mollusc (3,4)
5 Mediterranean island, home to the s'Albufera nature reserve (7)
9 Clump of short flower stalks, as seen on parsley or fennel (5)
10 Nettle rash (9)
11 Avian vocalisations (4,5)
12 Small, oily marine fish (5)
13 A type of parasite (7)
15 ____ stinkhorn, US fungus with a crinoline-like structure (7)
17 Large goose, often feral in the UK (7)
19 European grazing mammal of forests and farmland (3,4)
21 Otter's home (5)
23 Fruiting plant in the genus *Rubus* (9)
25 Stretch of seashore (9)
26 Snow leopard, archaically (5)
27 Term for fish in the family Tetraodontidae, sometimes known as blowers (7)
28 Skull cavities close to the nose (7)

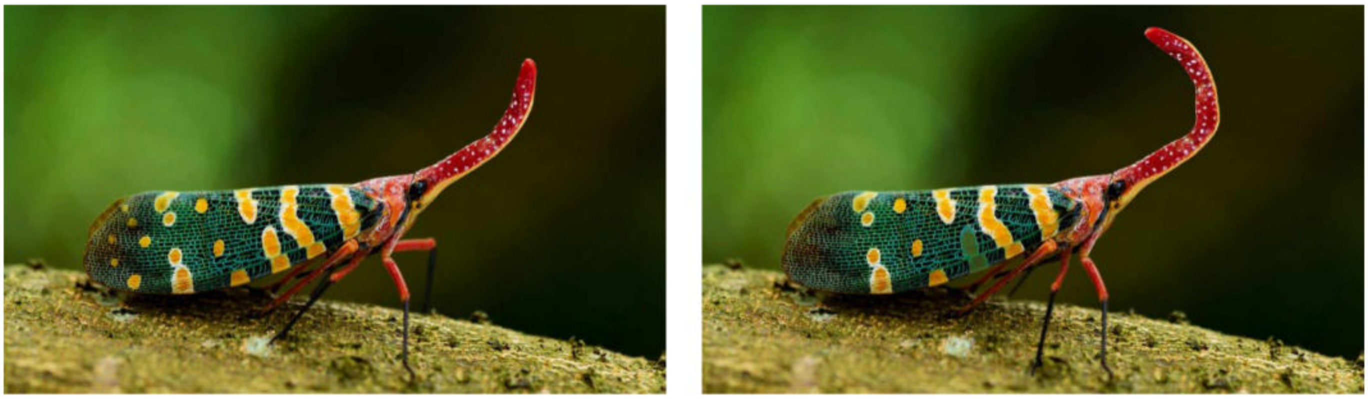
DOWN
1 Stalks left after harvesting, important to farmland birds (7)
2 Eggplant (9)
3 Shrub in the genus *Syringa* with pink, purple or white flowers (5)
4 Wild sheep of Eurasia (7)
5 Type of cell division (7)
6 Small, streaked wading bird, *Lymnocryptes minimus* (4,5)
7 More scarce (5)
8 Evolved to fit (an ecosystem, say) (7)
14 Insect that discharges a greasy, poisonous fluid when threatened (3,6)
16 Circles within a trunk (4,5)
17 Yellow wildflower also called frog's foot or St Anthony's turnip (7)
18 Desert rodent of Africa and Asia (7)
19 Reproduces as an annual plant does (7)
20 Of a plant, lacking florets (7)
22 Term often used for smaller members of a family or genus (5)
24 ____ kiwi, New Zealand bird that may be Northern or Southern (5)

September crossword

Across: 7 King crab, 9 Prey on, 10 Inky, 11 Sneezewort, 12/23/18 Black-necked grebe, 14 Drop-ripe, 16 African violet, 17 Bullfish, 21 Swan potato, 22 Worm, 24 Tadpoles

Down: 1 Signal, 2 Ugly, 3 Grass, 4 Epizootic, 5 Red warbler, 6 Four-spot, 8 Bleeding-heart, 13 Coral snake, 15 Echinoids, 16 Agueweed, 19 Barbet, 20 Noddy, 22 Wood

SPOT THE DIFFERENCE



The lanternfly (*Pyrops candelaria*) is a planthopper found in southeast Asia. This bug has an elongated snout that operates as a straw to get into the bark of trees and retrieve sap. Can you spot all five differences between the two images? Turn to page 96 to find the answers.

CROSSWORD SET BY RICHARD SMYTH. LANTERN BUG: MAGNUS LUNDGREN/WILD WONDERS OF CHINA/NATUREPL.COM

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Your LETTERS

The vocalisations of snow buntings help to establish their territory

Free as a bird

THE ARTICLE ON HOW ANIMALS USE sound in the September issue included comment on dialect or accent in birdsong. This reminded me of a passage in the book *Incredible Journeys* by David Barrie. He relates how a British explorer was kayaking along the east coast of Greenland with an Inuit hunting party. The combination of a heavy swell and thick fog made him anxious as to how they would locate their home fjord. The Inuits seemed perfectly relaxed and they eventually took the correct turn. Afterwards they explained that snow buntings nested at the mouth of fjords and each male proclaimed his territory by singing from a high boulder. Being more attuned to the natural world, they had realised that each territorial song had a slight difference. They just waited to hear the right one before turning inshore.
Richard Stewart, Ipswich

Invasive species

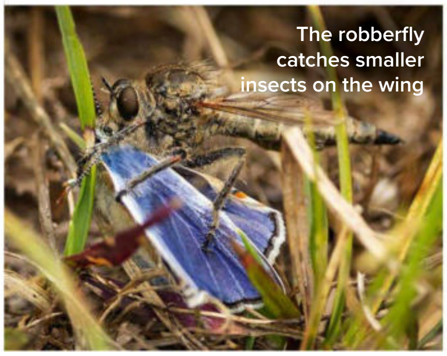
I was horrified to read the article on the intention to cull so many 'alien species' in New Zealand (September issue). The language used to describe these creatures is cruel and derogatory. So typical of humans to transport animals from their natural habitat simply for their own selfish needs, upsetting the balance of nature, then cursing these animals who have done nothing more than learn to survive in a new environment.
Caroline Harrison, via email

Barbary lions

Over the years I have read several accounts of the extinct Barbary lion, the large member of the lion family that once ranged over North Africa. The species was believed to have become extinct in the early 20th century, but I have recently read that a zoo in the Czech Republic claims to have Barbary lions and has been successful in breeding them. Can you shed any light?
Peter Lock, Bristol

Acting production editor Oliver Hurley replies: **Barbary lions (subspecies *Panthera leo leo*) once inhabited much of the Maghreb region in North Africa and were one of the largest known lions, weighing up to 230kg – one of the reasons they were used in Roman gladiatorial games. They were largely wiped out by European hunters by the end of the 1800s, due to their attacks of livestock.**

The Moroccan royal family kept a number of Barbary lions in the late 19th and early 20th centuries. It is descendants of these animals that can be seen in zoos today – including Dvůr Králové Safari Park in the Czech Republic and Belfast Zoo – though genetic studies have not been able to rule out that the royal family's lions may have been the products of breeding with sub-Saharan African lions. Preliminary steps have taken place for a potential reintroduction of Barbary lions into their natural habitat, and talks are continuing with Moroccan authorities about doing so in one of the national parks in the Atlas Mountains.



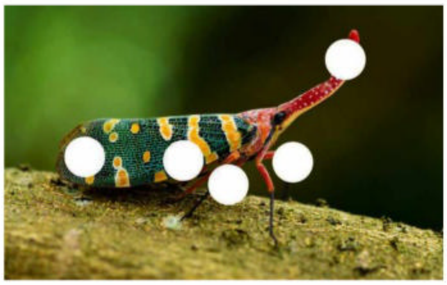
The robberfly catches smaller insects on the wing

Butterfly blues

I was out walking near Steyning, West Sussex, in the South Downs looking for butterflies and got a surprise when just a few feet from us this common blue butterfly was snatched out of the air by a robberfly. It sat there literally sucking the life out of its victim allowing a photo from about 1.8m with a 100-500mm zoom lens.
Richard Allan, via email

African wild dogs

I was excited to see a wild dog on the cover of the September issue. I am an enthusiast of the species and enjoyed Bella Falk's beautiful photographs and enthusiastic prose. Like her, I was so overly excited on my first sighting that I nearly crashed our vehicle. Since then I see them increasingly frequently on my visits to South Africa's Kruger Park. The feeding deference to pups at a kill that was mentioned does not accord with my observations – alphas first, other adults next and pups last of all. Richard D Estes, author of the definitive guide *The Safari Companion*, describes pups as laggards, missing the chase and turning up to feast on the remains.
Max Bullough, Winchester



Answers to Spot the Difference on page 101

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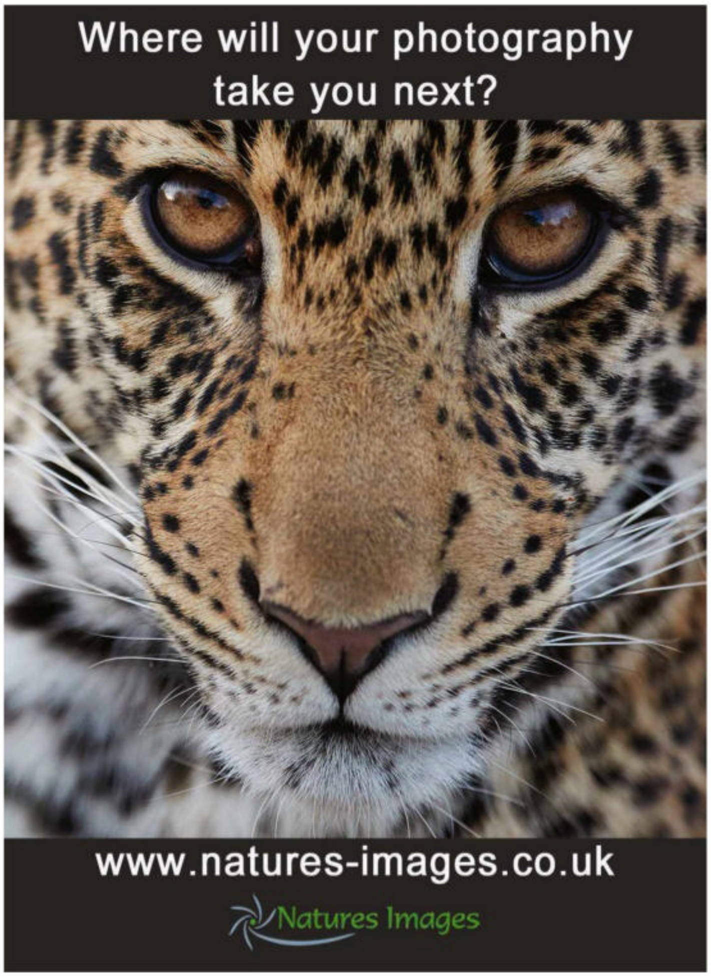

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The Angolan colobus is particularly vulnerable as its habitat disappears

NEXT MONTH

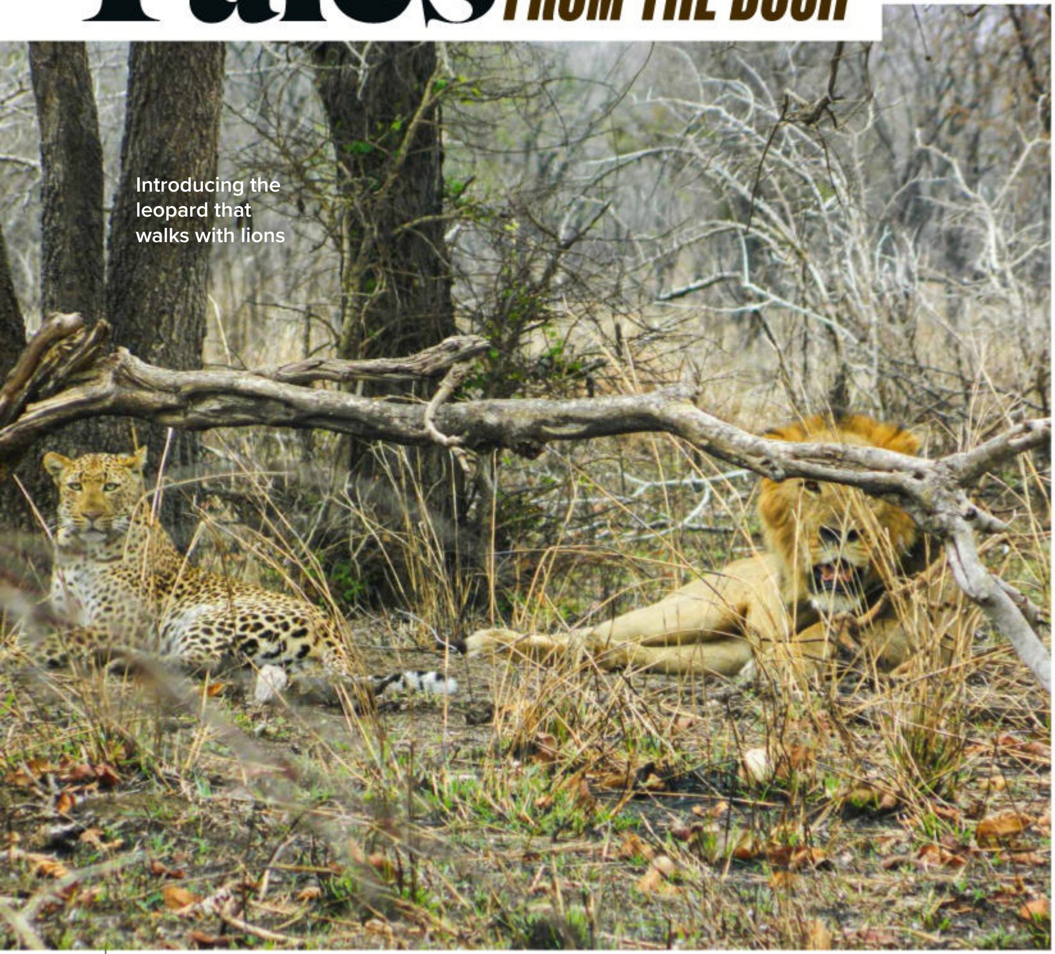
Beach monkeys

Coastal primates are overrunning Kenya's tourist hotspots in the south of the country. Beth Richardson travels to Diani Beach to explore how overdevelopment and habitat loss is forcing monkeys out of the forest and into human worlds – and the conservation efforts of the last three decades that have helped species such as the Angolan colobus stay out of danger.

ON SALE
13th
NOVEMBER

ANGOLAN COLOBUS MONKEY: ROLAND SEITRE/NATUREPL.COM

Tales FROM THE BUSH



Introducing the leopard that walks with lions

“I have never known fear like it”

Leopard and lions in Mozambique

BY DOUGLAS FLYNN

“It is ancient wisdom that a leopard cannot change its spots. But after a stunning encounter in the heart of one of Africa’s last great wild places, I no longer believe this to be true.

Under the starlit skies of the iconic Gorongosa National Park in Mozambique, my job, assisted by five specially trained scent-hounds and their expert handler, was to locate a female leopard, tranquilise her and fit her with a new radio-collar. A blend of modern science and the ancient art of tracking prey on foot, all in the impenetrable inky blackness of the African night.

We were interested in this particular female because we had some shaky footage and a few photos, captured more than a year ago, of her interacting with a pride of lions. But that was all we had. To find her, we had to rely on more old-fashioned methods – the dogs’ superb sense of smell and evidence of tracks on the ground.

The consensus was that the behaviour was a one-off, unlikely to signify a lasting bond. While in the planning stages of our operation we had predicted that, even if the leopard was still interacting with the lions, this fragile inter-species link would break when she realised she was being followed. Leopards climb trees to avoid danger, whereas lions flee on the ground. And under pressure, wild animals typically revert to instinctive behaviours. Despite its liquid grace and ability to run, surely a leopard cannot slip off its spotted cloak?

Yet, as we crouched our way through a riddle of narrow, mazy tunnels in the thickets of a dry riverbed, we were hit by a terrifying realisation: our leopard had led us straight to the lions.

Fear is, of course, a feeling. But in this case, it was also a smell: the pungent, acrid odour of lions that hung heavily in the oppressive stillness of those narrowing, clawing tunnels.

Some things happen slowly, and then all at once. We had been following this leopard over four long, painstaking nights, and evidence had slowly been mounting that she was not behaving as expected. But it was over the course of just a few seconds, as she led us into that nightmarish maze, that everything changed.

Operations such as this are about calculated risk. Following a lone leopard in the dark carries significant dangers but, under the supervision of professionals, the risk is acceptable. We had pushed as hard as we could, but the level of danger had now crossed a threshold.

“Get out! Get out! Get out!”

The hunters had become the hunted. We had to back out, and we had to do it fast. Hearts racing, we retreated, our eyes and ears urgently scanning the thicketed blackness for a dreaded ambush. I have never known fear like it.

Thankfully, as we made our getaway, the pungent smell of those fearsome cats faded and we reached safety. But ever since that night, my mind has been pursued by a restless stream of questioning. Why would this leopard join forces with lions, and how long has this extraordinary coalition been together? When they hunt, do they hunt as one? When they kill, how do they divide the spoils? Does she still sleep in a tree like her ancestors, or on the ground beside her new-found comrades?

The mystery of the leopard who thinks she is a lion may be solved another day. Yet despite these tantalising questions, much of me hopes that it is not. Because part of the magic and the restorative power of nature lies in the unknown; that awe-inspiring feeling when we shake our heads and admit that we just don’t understand.

And what could be a more spine-tingling thought than this: somewhere out there, in the shadows of this beautiful and wild land, is a leopard who has changed her spots.

ABOUT THE AUTHOR

Doug is a director of the Gorongosa Restoration Project and a passionate advocate for Africa’s last wild places.

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